TWEED SHIRE COUNCIL

Review of Environmental Factors

Tweed River flood restoration works, Dum Dum and Uki

June 2023

Version control

Version number		Date	Prepared by	Reviewed by
1.0	Draft for internal review	18/5/2023	Engineering Division Environmental Scientists	Engineering Division Environmental Scientists
1.1	Final Draft for Project Client and Project Manager Signoff	27/6/2023	Engineering Division Environmental Scientists	Sustainability and Environment
1.2	Final	3/7/2023	Engineering Division Environmental Scientists	Engineering Division Environmental Scientists

Disclaimer

Tweed Shire Council reserves the right to correct, amend and update the REF content and materials from time to time in its absolute discretion. You should not rely on any materials unless you have separately applied in writing for and received written confirmation from Council that such information is correct and up to date.

You should seek appropriate legal or other professional advice before relying or acting on any REF materials or information.

The REF materials are provided 'as is' and Council makes no representations or warranties in relation to the quality, accuracy, completeness, merchantability or fitness for purpose of this report or that the materials are free from defects.

To the maximum extent permitted by law, Council excludes completely all liability to any person for loss or damage of any kind (however caused, including by negligence) arising from or relating in any way to this report or any use of the report materials.

If the *Competition and Consumer Act 2010* (Cth) or any other applicable legislation implies any conditions or warranties into these terms of use for which Council's liability may not be excluded or limited, then nothing in these terms is to be construed as affecting your statutory rights in relation to such implied conditions and warranties.

If Council is permitted under the *Competition and Consumer Act 2010* (Cth) or any other applicable legislation to limit its liability for any implied conditions or warranties, then its liability is limited to the maximum extent permitted by law (for example, at its election, to the resupply of materials or the payment of the reasonable cost of having them supplied again).

Table of contents

Important notes and definitions

This Review of Environmental Factors (REF) has been prepared in accordance with the Tweed Shire Council Procedure titled: Environmental assessment procedures for Council Infrastructure Works V1.0, 2019 (the Procedure).

REF (Type A projects) template: Infrastructure works assessed using the REF (Type A project) template include routine maintenance works, emergency works, and projects with minor or predictable environmental impacts that can be managed using standard operating procedures and work methods, and industry adopted mitigation measures and management approaches.

Projects assessed using this template typically have minor environmental impacts, and do not require detailed assessment and environmental management plans to manage or offset project impacts. Refer to Part C, Section 5.0 of the Procedure for further guidance on REF assessment pathways.

Prior to works commencing

An activity under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A) must not be commenced prior to both the REF being "determined" by an appropriately delegated staff member and the determination report (the certified REF) being recorded in the Council's electronic data/records system.

The REF must sign off that Council has fulfilled its duty to consider the environmental impact of the activity pursuant to Section 5.5 of the EP&A Act. This includes certifying that the environmental safeguards and mitigation measures proposed ensure the environmental impact is not significant.

It is the responsibility of the person completing this REF that:

- Section 9.0 (certification and signoff) of this REF has been completed
- the project can proceed subject to project mitigation measures and relevant environmental safeguards outlined in Section 10.0 and any associated plans and external authorities
- all relevant approvals, licences, and permits have been obtained prior to works commencing
- all relevant construction personnel are aware of:
    - their responsibilities under this REF
    - the project specific mitigation measures and environmental safeguards outlined in Section 10.0
    - the conditions in any approvals, licences or permits
    - the project details and likely impacts of the project on the community.

Consultation

Environmental planning instruments (EPIs) set out obligations to notify and/or consult with stakeholders, including state agencies, councils and the community as part of the Division 5.1 process of the EP&A Act. Community consultation and referrals may also be required for certain types of approvals (consents, licences and permits) granted by determining authorities under legislation other than the EP&A Act. Proponents and determining authorities must consider any feedback from stakeholders on the proposed activity and/or its environmental impacts. EPIs set out obligations to notify stakeholders. All notification and consultation requirements must be met before a determination is made on the activity. A decision statement by each determining authority needs to be published alongside the published REF document.

Determining authorities will keep the following REF documentation available for public access once a determination has been made:

- the final REF document including appendices
- any associated SIS or BDAR
- the Decision Statement
- any REF document addenda.

The REF must be published on the determining authority's website or the NSW planning portal if the activity is triggered by any of the requirements outlined in clause 171(4) of the EP&A Regulation (clause 171(4)). For further information, refer to Section 6.0 of this REF.

Terms of reference for the assessment

For the purposes of this assessment, the following terms of reference are used:

- Disturbance footprint – refers to the direct footprint subject to development, including any disturbance associated with ancillary works (e.g. temporary access tracks or stockpile sites).
- Study area – the study area includes the disturbance footprint and any additional lands approximately 50 m either side of the disturbance footprint that could be affected directly or indirectly from the proposal. The objective of the assessment would ensure that impacts beyond the direct disturbance footprint are also considered where relevant.
- Subject site – refers to the parcel/s of land on which the development is proposed.
- Broader study area – lands within 10 km of the local study area and includes the Office of Environment and Heritage (OEH) Atlas of NSW Wildlife and Commonwealth Protected Matters database search areas.
- IBRA bioregion and subregion – the Interim Biogeographic Regionalisation for Australia (IBRA) identifies the lands within the Tweed Shire as within the South Eastern Queensland IBRA bioregion. Subregions within this bioregion include the Sunshine Coast-Gold Coast Lowlands, Burringbar-Conondale Ranges and Scenic Rim. These terms are used to describe the occurrence of threatened species, populations and communities at a regional level.

Direct and indirect impacts are defined in accordance with DPE (2022) as follows:

- Direct impacts are those that usually occur at the same time as the project and in the vicinity of the site.
    - For example, impacts may directly affect the habitat of species and ecological communities and of individuals using the study area. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat
- Indirect impacts are those that occur as a consequence of the project or the direct impacts of a project. They may be delayed and happen further away from the site.

- For example, impacts may sterilise or reduce the habitability of adjacent or connected habitats. They can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, reduction in viability of adjacent habitat due to edge effects, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, noise, light spill, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas.

Impact significance is rated as low, medium or high in this REF. Examples of low and high adverse impacts are as follows:

Low adverse impacts typically:	High adverse impacts typically:
are small scale	are large scale
are localised	are extensive
are short term	are long term
have a small impact dispersed over a long period	have a large impact over a short or long period
have reversible impacts	have potentially irreversible impacts
have effective mitigation measures available	have unavailable or untested mitigation measures
are totally compliant with standards, plans and policies	have uncertain or part compliance with standards, plans and policies
have a low interest from the public	have a high interest from the public
have a high level of understanding of the activity and expected impacts	have a low level of information on and understanding of the key issues

For further guidance on evaluating impacts, refer to Attachment A of the Department of Planning and Environment, Guidelines for Division 5.1 assessments, February 2022.

1.0 Project details

Table 1: Project details

Project name	Tweed River flood restoration, Dum Dum and Uki
Project location	Tweed River, adjacent and downstream of 1173 Kyogle Road, Uki (Figure 1 and 2)
Project owner	Tweed Shire Council
Project brief number	No brief
Environmental Scientist (assessing officer)	[redacted]
Determining Officer	[redacted]
Project Client	[redacted]
Project Manager	[redacted]

2.0 Site details

Table 2.1: Site details

Site/Parcel description	Zoning	Landowner
Tweed River	W1 – Natural Waterways (Figure 3)	Tweed Shire Council (Figure 4)
1173 Kyogle Road, Uki – Lot 1 DP608473	RU2 – Rural Landscape	[redacted]
Riverside Park – Lot 20 DP804812	RE1 – Public Recreation	Tweed Shire Council – Community Land (Council Owned)

TABLE NOTES:
A: For works on Crown Land refer to Activity Specific Procedure – Council Infrastructure Works on Crown Land.
B: Owner's consent is not required for the preparation of Part 5 assessments of private land. Prior to works commencing on private land, Council officers are to notify property owners advising details of project and entry to land as permitted by the Powers of Entry provisions in sections 191A-193 of the Local Government Act, 1993.

3.0 Proposal description and permissibility

Table 3.1: Project proposal details

Description	Comment
Project background and need	From November 2021 to June 2022, Australia was experiencing a La Niña weather event (BOM[1], 2022). This caused above average rainfall leading to major flooding in the Tweed Shire. The rainfall and multiple flood events (specifically the flood from February to March 2022) have caused erosion and deposition of the Tweed River bed and banks leading to loss of public park and private land. This section of the Tweed River now requires bank stabilisation to prevent further loss of land and vegetation. Kyogle Road is also at risk of being affected by future flooding events, if further erosion was to occur.
Alternatives considered	A do-nothing approach was considered, however this would most likely lead to further erosion and land loss, damage to Kyogle Road and a decrease in waterway and ecosystem health. This was not a viable option. The proposed works to restore and stabilise the riverbed and banks would utilise a number of methods. The major disturbance of the subject site caused by flood events requires methodologies that would stabilise current substrate and allow for soil accretion in the future. These methods would provide stabilisation into the long term with the addition of habitat features and other engineering that would provide long term stability of the bed and banks.
Proposal description key project elements (e.g. nature, scale and extent of proposed activity)	The proposed works would utilise a combination of stabilisation techniques which would be chosen depending on the size and scale of erosion at various sections along the river. The techniques include: • pin rows (pile fields/groynes) driven into existing bed material and extending 2/3 in and 1/3 out (i.e. at least 2 m into the bed) • rock girdles placed perpendicular to the flow • snag hotels constructed the full length of the river section • corrugated rock revetment (1–3 m in height depending on bank height and would not extend full bank height) using 400–700 mm diameter rock; sections may be trenched to a depth of 1 m

Description	Comment
	• A-frame deflectors constructed with 5 m hardwood logs and one with a rootball, filled with quarry rock and/or river gravel as ballast • minor bank battering at top of bank to provide a more stable slope suitable for vegetation establishment (1V:3H) • initial riparian revegetation (mass planting) to extend to 5 m wide; future revegetation expected following accretion. The proposed disturbance footprint extends for approximately 755 m along the eastern side of the Tweed River bed and bank. Mature naturally occurring riparian vegetation and mature revegetated vegetation was lost during the flood events and the site is currently devoid of significant vegetation. Few trees remain. The scour embankment is variable and at a maximum is approximately 3 m from the top of bank to the water level or deposited bed material below.

Construction activities (e.g. how will the project be constructed?). Explain construction footprint, site preparation activities (e.g. vegetation clearing, alternate access etc.), construction timeframes, hours of operation, relevant work methods, plant and equipment, earthworks, management of materials, traffic and access management, sensitive receivers etc.)	In summary, the proposed activity would involve:
	• installation of environmental management controls
	• construction of a suitable access path to the site to enable delivery of materials and machinery
	• construction of bank stabilisation works using the following methodologies as depicted in Appendix A
	  ○ snag hotels
	  ○ pin rows
	  ○ pile fields
	  ○ A-frame deflectors with ballast
	  ○ rock girdles
	  ○ corrugated rock revetment
	  ○ minor bank battering
	  ○ riparian revegetation of bank areas
	• stabilisation of any other disturbed surfaces
	• removal of environmental management controls and vegetation protection barriers.
	
	Design plans of the proposed works are provided in Appendix A of this REF.

Ancillary facilities (e.g. site compounds, stockpiles, set down areas, vegetation clearing and	Ancillary activities associated with construction of the proposed bank stabilisation works would include: • establishment of a construction compound

Description	Comment
protection requirements, sensitive receivers etc.)	• establishment of a suitable access path to the site to enable delivery of materials • material stockpiling • equipment laydown • environmental management activities (including erosion and sediment control, tree vegetation protection measures) All ancillary activities would be undertaken in previously cleared areas adjacent the alignment.
Property access and acquisition requirements	The proposed works would occur within the Council-owned Riverside Park, private property and the Tweed River. Engagement with the landowner would occur prior to undertaking works to ensure safe access is available. No acquisition of land is required. A land status search was undertaken for the Tweed River. It identified that there was presumptive title to the centreline of the river, meaning that the Tweed Shire Council owns to the centreline of the Tweed River adjacent Riverside Park.
Estimated construction commencement date	July 2023
Estimated construction completion date	October 2023
Estimated cost of works	[redacted]
Construction hours	Monday to Saturday 7 am to 6 pm. No works Sunday or public holidays.

Table 3.2: Environmental site description

Description	Comment
Include a brief background description of the following environmental assessment elements.	
Biodiversity (vegetation communities, flora and fauna species)	The proposed works alignment comprises Council-owned community land, private property and the Tweed River waterway. Prior to the floods, each of the land parcels had varying stages of vegetation. The Tweed Vegetation Management Strategy (TVMS) mapping (Kingston, 1994) identifies 3 vegetation communities as occurring within the study area, being 'Camphor laurel dominated closed to open

Description	Comment
	forest', 'Substantially cleared of native vegetation' and 'Open water'. Field investigations indicate that the vegetation mapping is generally reflective of the site of the vegetation that remains. Prior to the flooding, there were also areas of maturing revegetation however, much of this has been impacted and lost during the flood events.
Surface water and ground water	The proposed works occur on the bed and banks of the Tweed River.
Flood-prone land	The subject site is impacted by flooding during periods of high rainfall as it is located on the banks of the Tweed River.
Soils and geology	The soil landscape within the proposed works alignment is identified as the Oxley (ox) landscape (Morand, 1996). The Oxley landscape is described as level to gently undulating alluvial plains of the mid Oxley and Tweed catchments. Slopes of <2%, local relief <9 m, plain width 250–1000 m. Inset terraces are common. The vegetation of this landscape is described as extensively cleared closed-forest (rainforest). The soils of this landscape are described as shallow to moderately deep (up to 100 cm), imperfectly drained Alluvial Soils and/or minimal Prairie Soils on floodplain/bar plain. Deep (>200 cm), moderately well-drained minimal Prairie Soils and dark Alluvial Clays on alluvial plain. Limitations of this landscape include flood hazard, streambank erosion hazard, highly erodible soils, localised waterlogging, localised permanently high water tables and stoniness.
Bushfire risk	The subject site is located within mapped area of Vegetation Category 1 and bushfire buffer as per the Bushfire Prone Land mapping 2012.
Coastal hazards	The subject site is located outside of coastal hazard mapped areas.
Extreme climate/weather events	The subject site is likely to be impacted by extreme climate and weather events.
Traffic and transport	The proposed works alignment occurs within Council-owned parkland, private property and the Tweed River. Kyogle Road is adjacent to the proposed works site. Traffic counts for Kyogle Road adjacent the site in 2003 were 2,967 daily vehicle movements (vm/d). Similar counts of

Description	Comment
	approximately 3,800 vm/d were also recorded along Kyogle Road in 2015 immediately after the Byangum Bridge crossing which is located further to the east from the subject site.
Noise and vibration	The subject site is situated within a rural area which is considered to be a low noise environment. However, background sources of noise at the site include vehicular traffic from Kyogle Road and surrounding rural properties.
Scenic value	The subject site is visible to road users of Kyogle Road and neighbouring properties. Under the Draft Scenic Landscape Strategy the landscape character unit of the subject site is classified as rural hills and valleys with no viewsheds mapped.
Property and land use	The proposed works comprise of private property, public Council-owned parkland and the Tweed River.
Public access	The subject site located in public parkland has unrestricted access to the public. The Tweed River is also accessible to the general public via the parkland. The private property has restricted access to the public.
Aboriginal heritage and historic (non-Aboriginal) heritage	The proposed works footprint is not associated with any State or local heritage items. [redacted]
Any other environmental elements	Nil.

Table 3.3: Consultation

Description	Comment
Include a description of the public authority and community consultation requirements and outcomes.	
Public authorities	Part 2 Division 1 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) defines the consultation required with relevant public authorities during the assessment process and prior to development commencing. Sections 2.15(1) and 2.15(2) refer to the proponent's consultation requirements with public authorities other than Councils for a specified development. Section 2.15(1) states that a public authority must not carry out specified development that this Policy provides may be

Description	Comment
	carried out without consent, unless the authority has provided notice to respective authorities as per subsection 2.15(1)(a) and (b). The proposed works are not considered specified development.
Community consultation	The proposed design has been developed in consultation with the landowner. Community engagement would occur prior to works being undertaken in line with the Community Engagement and Participation Plan 2019–2024.

Table 3.4: Permissibility of the proposal

Description	Comment
Relevant planning instrument	State Environmental Planning Policy (Transport and Infrastructure) 2021
Division/section/subsection	Division 25 Waterway or foreshore management activities 2.165 Development permitted without consent
Controlling provisions/performance criteria	(1) Development for the purpose of waterway or foreshore management activities may be carried out by or on behalf of a public authority without consent on any land (2) To avoid doubt, subsection (1) does not permit the subdivision of any land. (3) In this section, a reference to development for the purpose of a waterway or foreshore management activities includes a reference to development for any of the following purposes if the development is in connection with waterway or foreshore management activities— (a) construction works (c) emergency works, including works required as a result of flooding, storms or erosion (d) environmental management works
Comments	In this Division ***waterway or foreshore management activities*** means— (a) riparian corridor and bank management, including erosion control, bank stabilisation, re-snagging, weed management, revegetation and the creation of foreshore access ways (b) instream management or dredging to rehabilitate aquatic habitat or to maintain or restore

Description	Comment
	environmental flows or tidal flows for ecological purposes.

Table 3.5: Design options

Description	Comment
Include a description of design constraints and measures taken to avoid and minimise potential environmental impacts.	
Avoid/minimise/offset measures	Avoid Native mature vegetation would be retained and protected and therefore negligible impacts are expected. Minimise The proposed method will reduce further erosion and stabilise the bank in the short and long term. The do-nothing approach will eventually lead to more loss of land and a decline in ecosystem and waterway health. The subject site currently lacks quality habitat for flora and fauna due to the scale of the erosion, and therefore the potential of environmental impacts of the proposed works is negligible. Offset No offsets would be required.

4.0 Duty to consider environmental impacts pursuant to Section 5.5 of the *Environmental Planning and Assessment Act 1979*

4.1 Confirmation of design and construction footprint

This section is to confirm the design and construction footprint of the proposed activity prior to undertaking the environmental impact assessment in the following sections.

Table 4.1: Confirmation of design and construction footprint

Footprint type	Confirmed (Yes/No)	Date confirmed	Comment or outcome (e.g. Design footprint confirmed by Civil Engineering Designer; construction footprint confirmed by Construction Engineer; not relevant as works are within an existing building)
Design footprint	Yes	19/4/2023	Design footprint confirmed by project manager by email
Construction footprint	Yes	19/4/2023	Construction footprint confirmed by project manager by email

4.2 Environmental planning requirements

This section is intended to fulfil the duty to consider environmental impacts pursuant to Section 5.5 of the EP&A Act 1979:

"a determining authority in its consideration of an activity shall … examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity."

Table 4.2: Environmental planning, cultural, and community impact considerations and assessment

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
		(Yes/No)	(Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	(Low, medium, high)[2]	(See notes below)
Environmental and ecological considerations					
1	Does the subject site contain Environmental Protection Zones (as defined under the Tweed LEP 2014)?	No	N/A	N/A	N/A
2	Are works within or adjacent to a national park, nature reserve, Aboriginal area, conservation area, marine park or marine reserve?	No	N/A	N/A	N/A
3	Does the subject site contain Matters of National Environmental Significance (NES) (RAMSAR Wetlands, threatened species, migratory birds, World Heritage, National Heritage, nature reserve etc.) or on Commonwealth land (refer Commonwealth Department of Agriculture, Water and the Environment)?	Yes	Refer to Appendix B for the assessment of the matters of NES. [redacted]	Low	A

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
4	Will the project impact upon Matters of NES described above?	Yes	No. The proposed works are unlikely to impact upon matters of NES. [redacted]	Low	A
5	Are works within or near areas protected by State Environmental Planning Policies (SEPP) for conservation purposes?	No	N/A	N/A	N/A
6	Does the subject site contain NSW endangered or vulnerable species, populations, or ecological communities or their habitats, pursuant to the NSW *Biodiversity Conservation Act 2016* (BC Act) or the *Fisheries Management Act 1994* (FM Act)?	Yes	[redacted]	Low Low	A A
7	Will the project impact upon NSW endangered or vulnerable species, populations, or ecological communities or their habitats, pursuant to the NSW BC Act or the FM Act?	Yes	[redacted]	Low Low	A A

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
8	Does the subject site contain, or is the site adjacent to a flying-fox colony?	No	[redacted]	Low	A
9	Does the subject site contain, or is the site adjacent to a raptor nest?	No	N/A	N/A	N/A
10	Does the subject site contain habitat areas falling within an identified wildlife corridor?	Yes	The upstream section of the subject site is within a regional wildlife corridor. The proposed works of stabilising the banks of the Tweed River and revegetating will improve wildlife corridors in the long-term. The short-term duration of the works are unlikely to directly or indirectly cause impacts to flora or fauna utilising the wildlife corridors.	Low	A
11	Is native vegetation (including understorey vegetation layers), or native trees likely to be affected? Native vegetation includes marine vegetation (i.e. mangroves, saltmarsh, or seagrass), freshwater wetlands with emergent or floating plants, sedgelands, native grasslands, heath and shrub lands, woodlands, open forests and rainforests?	Yes	The mature native vegetation that was present within the subject site including historical revegetation was mostly lost during the floods in 2022. The proposed works will retain mature vegetation to ensure no impacts.	Low	A
12	Removing or lopping trees within an area mapped under a Tree Preservation Order?	No	N/A	N/A	N/A
13	Does the proposed works include artificial lighting?	No	N/A	N/A	N/A
14	Does works involve dredging and/or reclamation of water land (refer Department of Primary Industries (DPI) Fisheries)?	Yes	The proposed works involve dredge and reclamation of water land being the Tweed River bed and banks. The flooding in 2022 caused significant changes to the bed and bank location and height causing erosion, loss of vegetation, loss of land and threats to Kyogle Road. The proposed works will involve installation of pile fields, rock revetment, bank battering, A-frame deflectors and rock girdles all of which would require either dredge and/or reclamation.	Low	A, B

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
			Under Part 7, Division 3 of the *Fisheries Management Act 1994 (FM Act)*, section 200(1) states a local government authority must not carry out dredging work or reclamation work except under the authority of a permit issued by the Minister. Accordingly a dredge and reclamation permit would be applied for prior to works being undertaken. Refer to permit attached in Appendix G.		
15	Would development comprise a fixed or floating structure in or over navigable waters (consultation required with Transport for NSW – Maritime)?	No	N/A	N/A	N/A
16	Working within a Crown Land waterway, Coastal Reserve, or other Crown Land reserve?	Yes	The Tweed River is identified as a Crown waterway. However, a land status search was conducted to understand the title to land with frontage to non-tidal water being presumptive title to half of the stream bed (i.e. *ad medium filum aquae – centre thread of the water*). The land status search was conducted for both lots of freehold land being Lot 20 DP804812 and Lot 1 DP608473. The results concluded that the owners of both Lot 20 and Lot 1 enjoy presumptive title to the centreline of the waterway and therefore a Crown Land licence is not required to undertake any of the proposed works.	Low	A
Historic archaeological heritage considerations					
17	Are works within the 'place' of a 'Heritage Item' identified on the Register of the National Estate, under the NSW *Heritage Act 1977* or an environmental planning instrument (refer Commonwealth and State Heritage Registers, Schedules of the Tweed Local Environmental Plan 2014 (TLEP))?	No	N/A	N/A	N/A
18	Are works within or adjacent to a mapped predictive or known location of Aboriginal Cultural Heritage (ACH) identified in the	No	[redacted]	Low	A

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
	Aboriginal Cultural Heritage Management Plan (ACHMP) 2018? Is it located in or near a declared site or place identified by the Aboriginal Heritage Information Systems (AHIMS) Web Services?		[redacted] Refer to section 4.5 and Appendix D for further information.		
Community considerations					
19	In regards to specified development described in Division 1 of the SEPP Transport and Infrastructure, is consultation required with other public authorities?	No	N/A	N/A	N/A
20	Will the project involve generating, handling, storing, transporting or disposing of special (e.g. asbestos, clinical, tyres), liquid, hazardous (batteries, coal tar, lead paint waste etc.), or restricted solid waste (e.g. contaminated soil etc.), dangerous goods, or controlled chemicals?	No	N/A	N/A	A
21	Involve discharging anything to a waterway or stormwater drain?	Yes	Runoff from the subject site during construction is expected to enter the Tweed River. Mitigation measures including erosion and sediment controls will be implemented throughout construction. Maintenance of these controls will be undertaken periodically and after weather events to reduce impacts on the local waterway systems. Without these controls it is expected that a medium impact would occur on these waterways due to sediment entering the system. These controls reduce the sediment entering the waterways and therefore a low impact is expected during construction. Post-construction, all disturbed surfaces would be stabilised and controls will be removed. It is expected that there would be no impacts on waterways post-construction.	Low	A

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
22	Disturb subsurface or above ground utilities – Country Energy, Telstra, local council water and sewer?	No	Prior to works commencing, searches for subsurface or above ground utilities would be undertaken. Relevant consultation with utility providers would occur to ensure no impacts.	Low	A
23	Works requiring interception of a ground aquifer (i.e. dewatering)?	No	N/A	N/A	N/A
24	Works that intercept acid sulfate soils (ASS) or potential acid sulfate soils (PASS)?	No	N/A	N/A	N/A
25	Works involving noise generating activities such as pile drivers, hydraulic hammers, machine-mounted rock breakers, generators or similar equipment in an urban area?	Yes	The proposed construction works include the use of a number of plant including pile drivers. Typically pile drivers are recognised as causing noise impacts and would impact nearby sensitive receivers including residential dwellings. A preliminary noise assessment and management plan (Appendix F) has been undertaken to identify noise risk and to identify mitigation measures to reduce noise impacts (refer to mitigation measures in Section 10). It was identified that a medium risk of noise impacts would be experienced by nearby residential dwellings and respite periods may be required to reduce the impacts. The mitigation measures outline community engagement requirements. Community engagement would occur prior to construction. Refer to Appendix F.	Medium	A
26	Is it expected that traffic volumes would be similar to the most recent traffic counts? Is it expected that the proposed works would impact traffic?	Yes	It is expected that traffic volumes would be similar to those in 2003 being 2,967 daily vehicle movements for Kyogle Road as no large developments have occurred within the catchment that would increase daily traffic. The proposed works are located within private property and Council public park area. There is space available within the subject site where parking of vehicles and unloading of machinery, plant and materials can be undertaken. It is presumed that there would be negligible impacts to traffic on Kyogle Road however, if delays are expected due to the activities, a traffic management plan will be required to be implemented.	Low	A
Will works occur in other sensitive or constrained areas as outlined below?					

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
27	Working on a classified road including freeway, highway, main road, tourist road etc.?	No	N/A	N/A	N/A
28	Using flames during a total fire ban or working within bushfire protected lands?	No	N/A	N/A	N/A
29	Areas or items of high architectural, historical, environmental protection or scientific value?	No	N/A	N/A	N/A
30	Coastline and dune fields, caves, wetlands (not state significant) or other unique landforms?	Yes	The subject site is located adjacent to and within the Tweed River. The proposed works would stabilise the bed and banks of the waterway and improve ecosystem health in the long-term.	Low	A
31	Areas or items of high scenic value?	Yes	The proposed project is located adjacent to and within the Tweed River at Dum Dum and Uki. The subject site includes waterway, private property and public parkland. The subject site has no visibility (as per the Draft Scenic Landscape Strategy Interactive Mapping Tool) however would be visible from neighbouring properties and traffic users of Kyogle Road. The proposed development activities are routine in nature and will cause minimal visual disturbance to the existing visual character and quality of the surrounding landscape and therefore a basic visual impact assessment is satisfactory. Prior to construction the subject site is typical of a highly disturbed waterway that has been impacted by large flooding events, including vegetation loss, erosion and loss of land and in the interim between flooding in 2022 and the proposed works, weed invasion. During construction the site will have an increase in machinery, plant, vehicles and personnel. There would be parking available within the Council parkland within the site and would be used as the site compound. Post-construction, it is expected that there would be positive long-term impacts at the site and to the Tweed River ecosystem and waterway health. Any mature native vegetation present within the site would also be protected. In the short-term negligible adverse visual impacts would be experienced by vehicle users of Kyogle Road and nearby private property residents. Post-construction, the Council parkland and private property in which the works are proposed would be visually different to the current disturbed and eroded land and is expected to change over time with soil accretion and growth of revegetation. It is expected that the area would be representative of a riparian area similar to that in which it visually looked like prior to the 2022 flood events.	Low	A

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
			In the long-term, visual impacts are expected to improve within the rural hills and valleys landscape character. The Scenic Management Principles would be achieved as the proposed development would protect the Tweed River and improve the riparian vegetation and thereby the scenic character.		
32	Recreational areas (beaches, foreshores, parks, picnic areas, lookouts, national features, tourist areas, tourist roads/routes etc.)?	Yes	The proposed works are within a Tweed Shire Council public parkland called Riverside Park. The proposed works would improve the parkland by constructing natural features to assist with soil accretion which would replace large volumes of soil lost in the 2022 flood events. Revegetation would also improve the stabilisation of that soil and would improve the visual amenity of the parkland area.	Low	A
33	Erosion prone areas?	Yes	The subject site experienced large volumes of soil loss due to the flood events that occurred in 2022. Future floods are likely to cause erosion. The proposed works include the construction and installation of natural features including pile fields, rock revetment, bank battering, A-frame deflectors, rock girdles and revegetation. All of these methods are proposed to stabilise the riverbank for future flood events and it is expected that the proposed works would positively impact the immediate localised area.	Low	A
34	Bush regeneration areas, dune regeneration areas etc.?	Yes	The proposed works are located in an area that had previously been revegetated however, this vegetation was mostly lost during the flood events in 2022, therefore impacts to the revegetation has occurred via natural processes. The proposed works include revegetation.	Low	A
35	Areas of high bushfire risk?	Yes	The subject site is located in Vegetation Category 1 and Vegetation Buffer according to the 2012 Bushfire Prone mapping. The proposed works are unlikely to change the bushfire risk.	Low	A
36	Weeds?	Yes	The subject site has numerous weeds that have colonised since the 2022 flood events. The proposed works are unlikely to spread or introduce weeds. All plant and machinery would adhere to weed mitigation measures outlined in Section 10.	Low	A
37	Urban bushland or remnant roadside vegetation?	No	N/A	N/A	N/A
38	Major pedestrian routes (e.g. foreshore walks, around sporting venues etc.)?	No	N/A	N/A	N/A
39	Schools, childcare centres, playgrounds etc.?	Yes	The Mount Warning Community Preschool is located approximately 1km east of the subject site. It is separated from the subject site by multiple hills and valleys and is not expected to be impacted by the proposed works.	Low	A

Impact considerations		Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
40	Works on private land?	Yes	The proposed works would extend onto Lot 1 DP608473 which is private property. The proposed works would stabilise the current bed and banks of the Tweed River to prevent further loss of private land.	Low	A

[1] For further guidance on evaluating impacts, refer to Attachment A, Department of Planning and Environment, Guidelines for Division 5.1 assessments, February 2022.
[2] See the Terms of Reference for the Assessment section of this REF for explanation of low and high adverse impacts (pg 3).

[#]MITIGATION ACTIONS – the following actions are required as part of completing Table 4.1:

A: Include specific environmental safeguards if required within Section 10.0 to avoid, minimise or mitigate impacts of the project.
B: Attach a copy of the relevant approval, licence, permit or record of correspondence.
C: If the subject site contains Matters of National Environmental Significance, and works are not considered to impact upon these species, populations, or ecological communities, then complete the Matters of NES template and append to this application. If impacts are likely, a separate referral is required to the Commonwealth Department of Agriculture, Water and the Environment (AWE) and the project is not eligible to be lodged as an REF (Type A Project) template format. Refer to Part C, Section 5 for guidance on preparing an REF (Type B Project) template assessment.
D: If works are within the SEPP Resilience and Hazards area, and the Action Type is N/A, then comments or further assessment must be appended providing justification. There is no requirement to address matters within the SEPP Resilience and Hazards for activities under Part 5 of the EP&A Act unless required under the SEPP Transport and Infrastructure. Similarly, there are no requirements to undertake a SEPP Biodiversity and Conservation Koala assessment report for activities under Part 5 of the EP&A Act, however, clearing of koala feed trees within the Tweed Coast Comprehensive Koala Plan of Management area must be justified in accordance with Clause 5.4 of that plan.
E: A referral to the relevant authority is required under the SEPP Transport and Infrastructure and a period of 21 days allowed for response. All responses are to be considered and included in this assessment.
F: Undertake relevant database searches as described in Part C, Section 3.2, Section 5.0 and as identified within relevant Activity Specific Procedures in Part D of the Procedure.
G: If the subject site contains NSW endangered or vulnerable species, populations, or ecological communities or their habitats, pursuant to the BC Act or the FM Act, but these species or populations will not use on-site habitats on occasion, or will not be influenced by off-site impacts of the proposal as per the NSW Office of Environment and Heritage (OEH) Threatened Species Test of Significance Guidelines (OEH, 2018), then the project can proceed with caution subject to standard environmental safeguards in Section 10.0.
H: If the subject site contains NSW endangered and vulnerable species, populations, or ecological communities or their habitats, pursuant to the BC Act or the BC Act and the works are not considered to impact significantly upon these (refer to the NSW OEH Threatened Species Test of Significance Guidelines), then details must be appended providing justification. If impacts are likely and non-standard biodiversity mitigation measures are required to offset these impacts, the project is not eligible to be lodged as an REF (Type A Projects) template assessment and an REF (Type B Projects) template assessment must be used. Refer to Part C, Section 5.0, Table C5 of the Procedure for further guidance on REF template selection and to the Activity Specific Procedure – Biodiversity assessment and mitigation for guidance on offsetting approaches and requirements.
I: Councils are exempt from Controlled Activity Approvals under the Water Management Act 2000 (WM Act).
J: Geotechnical investigations would be undertaken prior to the commencement of works to determine the depth of groundwater and the presence of ASS. Should investigations identify that ASS would be impacted during construction, then an ASS management plan would be prepared prior to the commencement of works. Additionally, should investigations identify that groundwater is likely to be intercepted, then a dewatering management plan would be prepared prior to the commencement of works. Refer to the relevant Activity Specific Procedures in Part D of the Procedure for further guidance.
K: A biosecurity matter and a biosecurity impact are described in Section 10 and Section 13 of the Biosecurity Act 2015. Refer to Schedule 3 of the Biosecurity Regulation and the North Coast Regional Weed Strategic Management Plan 2017 for further information on priority weeds and their management.

4.3 Species Impact Statements (SIS) and Biodiversity Development Assessment Report (BDAR) requirements

Section 7.8 of the BC Act states that a proposal that is regarded as an activity that significantly affects terrestrial threatened species and ecological communities, or their habitats, is taken to also significantly affect the environment.

Section 221ZX of the FM Act states that an activity is likely to significantly affect the environment if aquatic threatened species, populations or ecological communities will be affected according to the test in section 220ZZ of the FM Act.

Table 4.3: Requirements of significant impacts

Significant impacts	Test to identify significant impact	Significant impacts likely for this proposal?	Required outcome of tests	Required for this activity? (N/A, REF, SIS, BDAR)
Will there be significant impacts on terrestrial threatened species, ecological communities or their habitats?	• Test of significance Section 7.3 of BC Act.	No (Refer to Appendix C)	No = REF Yes = REF & SIS or REF & BDAR If proponent elects to provide BDAR in place of SIS, then needs to consider whether proposed activity would exceed the biodiversity offset scheme threshold.	REF
Will there be significant impacts on aquatic threatened species, populations or ecological communities?	• Test in Section 220ZZ of FM Act.	No (Refer to Appendix C)	No = REF Yes = REF & SIS	REF

Significant impacts	**Test to identify significant impact**	**Significant impacts likely for this proposal?**	**Required outcome of tests**	**Required for this activity?** (N/A, REF, SIS, BDAR)
Will there be significant impacts on both terrestrial and aquatic threatened species, populations and/or ecological communities?	• Test of significance Section 7.3 of BC Act and • Test in Section 220ZZ of FM Act.	No (Refer to Appendix C)	No = REF Yes = REF & SIS & BDAR	REF

4.4 Tweed Shire Council's Contaminated Land Policy Assessment

Table 4.4: Response to TSC's Contaminated Land Assessment (V1.1) items of consideration

Item	Consideration	Response
1	Please specify all land uses to which the site has been put, including the current use.	A review of available historical aerial photography from 1961 to 2023 indicates that the subject area has predominantly been a rural landscape whereby the riparian area was historically cleared and adjacent land uses were for rural agricultural purposes until recent times. In the 1961 historical photo, the subject site appears to have been historically cleared of most vegetation except for a thin strip of riparian vegetation adjacent the Tweed River and the adjacent land to the east and west was used for agriculture including grazing and cropping (evident in imagery). The hill slope to the west had more vegetation present in the imagery. A farm house and associated buildings was present to the east and Kyogle Road was evident A comparison of the 1970 and 1986 aerial photos to the 1961 image indicates that vegetation growth significantly increased to the west of the Tweed River and along the riparian corridor on the east. In the 1990 image, Glenrock Rd had been constructed and houses within that subdivision had begun to be built. House construction continued and was evident in the 1996 imagery. No significant changes occurred in the imagery up to and including the 2016 imagery, just further growth of vegetation. The 2017 imagery was taken one month after the largest flood on record for the Tweed River at that time. Riparian vegetation had been lost and was evident in the imagery. Vegetation growth occurred to the 2021 imagery and had stabilised after the 2017 flood. The 2022 imagery was taken 3 months after the next subsequent largest flood on record. In the imagery it is evident that vegetation again had been lost as well as land loss on the eastern banks of the river. The most recent 2023 imagery is similar to that of the 2022 imagery. Refer to Figures 5 to 16 in Section 11.

Item	Consideration	Response
2	Is the proponent aware of uses to which properties adjoining the site have been put? If so, please specify.	No. Refer above.
3	Do any of the uses correlate with the potentially contaminating activities from current or historical land use? Refer to Table 1 in Schedule 1 of the Contaminated Land Policy for potential contaminants of concern.	No. Although agricultural land use was apparent within and surrounding the subject site, other historical land uses are not known. No sheds, yards or structures are visible in the sequence of historical aerial photos from 1961 through to 2023 within the subject site. The closest cattle dip site (the McCollums Dip) is located approximately 270 m east from the northern end of the works footprint, and is removed from the subject site.
4	If the answer to 3 is yes - has there been any testing or assessment of the site and, if so, what were the results?	A site walkover has been undertaken to identify and assess any evidence of historical or recent surface contamination at the site such as chemical drums, odours, discoloured patches of earth etc. This investigation did not identify any such evidence within or adjacent to the proposed alignment.
5	Is the proponent aware of any contamination on the site?	No.
6	What remediation work, if any (carried out voluntarily or ordered by a government agency), has been taken in respect to contamination which is or may	Nil, proceed with caution. Works would cease immediately if any potential source of contamination (e.g. soil discolouration, odours or asbestos material) is uncovered during construction. In such instances, further site investigations would be undertaken to determine if additional investigations or remediation in accordance with a council approved Remediation Action Plan would be required.

Item	Consideration	Response
	have been present on the site?	

Refer to the following document for further information: Tweed Shire Council Contaminated Land Policy Version 1.1, November 2007.

TABLE NOTES:
A: Refer to the Activity Specific Procedure – Preliminary contaminated land use assessments in Part D of the Procedure for further guidance.
B: In the event that contamination is suspected, chemical testing should be undertaken and a contamination assessment report appended to confirm that contaminated lands are not present and /or would not be impacted by the proposal.
C: Under section 60 of the Contaminated Land Management Act 1997, a person whose activities have contaminated land or a landowner whose land has been contaminated is required to notify NSW Environment Protection Authority (EPA) when they become aware of the contamination.

4.5 Preliminary acid sulfate soils assessment

Table 4.5: Preliminary acid sulfate soils assessment

Item	Consideration	Response
1	Is the project site located within a known mapped ASS constraint area as per Table 4.4 of classes below? If yes, please specify. If no, further assessment for ASS is NOT required.	No. No further assessment for ASS is required.
2	Will the projects maximum depth of excavation impact the identified ASS class? Please specify.	N/A
3	Has soil sampling and analysis been carried out to determine if an Acid Sulfate Soils Management Plan (ASSMP) is required? Please specify.	N/A
4	Based on the above items is an ASSMP required? Please specify.	No. The subject site is not located within any ASS mapped areas and therefore an ASSMP is not required.

Refer to the following documents for further information: TSC Acid Sulfate Soil Management Plan for Minor Works and Acid Sulfate Soil Manual (published by the Acid Sulfate Soil Management Advisory Committee (ASSMAC) 1998).

TABLE NOTES:
A: Refer to the Activity Specific Procedure – Preliminary contaminated land use assessments in Part D of the Procedure for further guidance.
B: In the event that ASS is suspected, chemical testing should be undertaken and an assessment report appended to confirm that ASS lands are not present and /or would not be impacted by the proposal and therefore requiring an ASSMP.

C: Under Part 7 Additional Local Provisions, Clause 7.1 ASS of the TLEP (2014), a person must not, without development consent, carry out works on land shown as being Class 1, 2, 3, 4 or 5 land on the series of maps held in the office of the Council and marked "Acid Sulfate Soils Map", being the works specified for the class of land.

Table 4.6: Classes of ASS as per ASS Maps (TLEP 2014)

Class of land	Specified works
1	• Any works.
2	• Works below the natural ground surface. • Works by which the water table is likely to be lowered.
3	• Works more than 1 metre below the natural ground surface. • Works by which the water table is likely to be lowered more than 1 metre below the natural ground surface.
4	• Works more than 2 metres below the natural ground surface. • Works by which the water table is likely to be lowered more than 2 metres below the natural ground surface.
5	• Works within 500 metres of Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the water table is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.

4.6 Aboriginal cultural heritage preliminary assessment

As explained within the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECC&W, 2010), the NSW Aboriginal cultural heritage due diligence assessment is a code of practice developed to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for consent in the form of an Aboriginal Heritage Impact Permit (AHIP). The *National Parks and Wildlife Act 1974* (NPW Act) provides that a person who exercises due diligence is determining that their actions will not harm Aboriginal objects and has a defence against prosecution for the strict liability offence if they later unknowingly harm an object without an AHIP.

Tweed Shire Council has developed a Preliminary Aboriginal Cultural Heritage Assessment (PACHA) to ensure Council infrastructure projects minimise the risk of harm to Aboriginal places and objects of cultural heritage significance. The objective is to identify those projects with a significant risk of harm to Aboriginal cultural heritage and conversely, those projects for which the risk of harm is low. Projects determined to have a high risk of harm to ACH require a more detailed assessment in the form of an Aboriginal Cultural Heritage Assessment Report (ACHAR) and potentially an Aboriginal Heritage Impact Permit (AHIP). Those determined to have a low risk of harm to ACH may proceed with caution without an ACHAR or AHIP.

A PACHA is provided in Appendix D. In summary, the PACHA found that harm to Aboriginal places and objects can be avoided and an ACHAR and AHIP is not required.

5.0 Clause 171(2) factors

According to clause 171(2) of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation 2021), Council must take into account the following factors when consideration is being given to the likely impact of the activity on the environment.

Table 5.1: Clause 171(2) assessment conditions

Matters for consideration	**Likely impact** (nil/positive/negative)
a Any environmental impact on a community	The assessment of this REF has demonstrated that there would be minimal environmental impact on the community.
b Any transformation of a locality	The proposed activity would result in a temporary transformation of the locality during construction in association with construction machinery, equipment and materials. Following construction, in the long term it is expected that the site would be reflective of the riparian corridor it once was prior to the flood of 2022.
c Any environmental impact on the ecosystems of the locality	The environmental impact on local ecosystems is expected to be initially minimal based on the scope of works and short duration of construction works however, it is expected that a positive impact in the long term would occur to the Tweed River ecosystems and waterway health.
d Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality	There would be a minor reduction in the aesthetic value of the locality due to the temporary presence of construction work and associated plant and control measures. Post-construction it is expected that environmental and scenic quality would improve in the long term.
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 proposed activity is not expected to negatively impact on any locality, place or building having aesthetic, anthropological, archaeological, architectural, or historic value.
f Any impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016)	The site is disturbed from past land uses and flood events. The site currently has minimal habitat value for fauna. Accordingly, the proposal would not have a significant impact on habitat of protected fauna species.

Matters for consideration		Likely impact
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 site is disturbed from past land uses and flood events. The site has minimal habitat value for fauna. Accordingly, the proposal would not have a significant impact on habitat relied upon by threatened, endangered or vulnerable species.
h	*Any long-term effects on the environment*	Mitigation measures listed in Section 10 of this REF would be implemented during construction to ensure that there are no long-term effects on the environment. Riverbank erosion stabilisation of public lands includes the use of vegetation and bio-engineered design that maximise ecological and amenity values and is a key environmental sustainability principle of the Tweed Shire Council Draft Environmental Sustainability Prioritisation Strategy – Council operations and environmental programs 2015–2020. Improving ecosystem health is a key priority identified in the Tweed Shire Council Climate Change Management Policy 2020. The proposed works of stabilising the waterway bank and reducing sedimentation into the waterway will work to improve the surrounding ecosystem health.
i	*Any degradation of the quality of the environment*	Construction works would likely result in some minor short-term impacts on the environment. Mitigation measures as listed in Section 10 of this REF would ensure that these impacts do not degrade the quality of the environment in the longer term.
j	*Any risk to the safety of the environment*	The proposed activity would have minimal risk to the safety of the environment. A range of risk management measures would be utilised during construction which are summarised in Section 10 of this REF.
k	*Any reduction in the range of beneficial uses of the environment*	The proposed activity would not reduce the overall range of beneficial uses of the environment.
l	*Any pollution of the environment*	The proposed works are expected to create noise caused by constructing the pile fields. The proposed works are short-term. Mitigation measures as listed in Section 10 of this REF including community engagement would minimise the risk of noise pollution to the community and environment during works.
m	*Any environmental problems associated with the disposal of waste*	There would be no environmental problems associated with the disposal of waste. There would be only a minor contribution of construction waste to landfill.
n	*Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply*	Some demand for additional materials would be generated as part of the proposed development. There would also be a minor contribution to reliance upon non-renewable fuel resources during construction.

Matters for consideration	Likely impact
o *Any cumulative environmental effect with other existing or likely future activities*	Construction machinery and plant relies on non-renewable fuel which contributes to atmospheric greenhouse gasses and, subsequently, anthropogenic climate change. Council's operations generate greenhouse gas emissions primarily from the use of fossil-fuel powered electricity (79% at July 2019), from burning transport fuels across Council's fleet (15% at July 2019) and from nitrous oxide and methane emissions from wastewater treatment plants (6% at July 2019). Although there are currently limited alternative energy sources for Council's plant and machinery, Council's Renewable Energy Action Plan (REAP) have set a target of reducing its greenhouse gas emissions from electricity use by 50% by 2025. Although there is currently a cumulative environmental effect from the generation of greenhouse gas emissions, measures listed within Council's REAP will mitigate long-term effects.
p *Any impact on coastal processes and coastal hazards, including those under projected climate change conditions*	The subject site is located outside the coastal hazard zone as per the Tweed Shire Coastal Hazards Assessment completed in November 2013. Therefore, the proposal is unlikely to impact upon coastal processes or hazards.
q *Any applicable local strategic planning statements, regional strategic plans or district plans made under the Act, Division 3.1*	The Local Strategic Planning Statement 2020 (LSPS) themes align with 4 goals from the North Coast Regional Plan 2036 (NCRP) being: 1 Natural environment 2 Thriving economy 3 Liveable communities 4 Diverse housing and lifestyles. The planning priorities within the LSPS are broadly consistent with the NCRP and the Community Strategic Plan 2017–2027 (CSP) strategic direction. This project incorporates the following planning priorities of the LSPS: • Planning priority 1: Protect the Tweed's significant natural environment, resources and landscape qualities, while cultivating sustainable growth and development, which promotes the health and vitality of the community. • Planning priority 2: Promote, protect, conserve and enhance the Tweed's high scenic quality, biological and ecological values for future generations and ecosystem health.

Matters for consideration	**Likely impact**
	• Planning priority 3: Increase resilience and adapt to the impacts of natural hazards and climate change to ensure our future prosperity and wellbeing. This project incorporates the following goals from the CSP: • Goal 1.1: Protect and manage the environment and natural beauty of the Tweed for current and future generations, and ensure that ecologically sustainability and climate change consideration underpin decision making in Council. • Goal 1.2: Protection of people and property by managing the risk of flooding and its impacts on property owners, the environment and the broader community. • Goal 3.2: Provide places for people to live, work, visit, play and enjoy the Tweed.
r Any other relevant environmental factors	No other relevant factors require consideration.

6.0 Publication requirements

According to clause 171(4) of the EP&A Regulation 2021, Council must publish REFs and all relevant information if identified in Table 6.1.

Table 6.1 Clause 171(4) publication requirements

Publication requirements[1, 2]	Publication requirement (yes or no)	Published[4] (n/a, TSC website)
A capital investment value of more than $5 million	No	N/A
An approval or permit for activity that requires approval under:		
• FM Act sections 144, 200, 205 or 219	Yes	TSC website
• *Heritage Act 1977* section 57	No	N/A
• *National Parks and Wildlife Act 1974* section 90	No	N/A
• *Protection of the Environment Operations Act 1977* sections 47–49 or 122	No	N/A
If the determining authority considers it to be in the public interest[3]	No	N/A

TABLE NOTES:

1 There are allowances for exceptional circumstances where publication is not required; this is at the Planning Secretary's discretion.
2 Where certain parts of this REF document is sensitive, such as sensitive cultural information requested to be redacted by Aboriginal parties or cyber security impacts and mitigation measures, in these instances, the REF document content can be redacted where required. The REF document (excluding sensitive information) needs to be available online.
3 For further guidance refer to Point 6 in Attachment A of the Department of Planning and Environment, Guidelines for Division 5.1 assessments, February 2022.
4 The review must be published before the activity commences; or if publishing the review before the activity commences is not practicable—as soon as practicable, and no later than 1 month, after the activity commences.

7.0 Supporting documentation

Table 7.1 below provides a summary of additional assessment, management plans, permits, licences and approvals required for the proposed activity.

Table 7.1: Summary of additional assessments, plans and approvals

Checklist of additional assessments, management plans, permits, licences or approvals	**Required?** (yes/no)	**Attached?** (yes/no)
Data base searches		
NSW Wildlife Atlas Flora and Fauna Records Search	Yes	No – Information on file and incorporated into Appendix C.
Commonwealth Protected Matters Search	Yes	No – Information on file and incorporated into Appendix B.
Aboriginal Heritage Information Management System search (AHIMS)	Yes	No – Information on file
State Heritage Inventory	Yes	No – Information on file
Maritime Heritage Database	No	N/A
Assessments		
Assessment of matter of National Environmental Significance	Yes	Yes. Refer to Appendix B.
Contaminated Lands Assessment	No	Due diligence assessment provided in Section 4.2.
Preliminary Flora and Fauna Assessment	Yes	Yes. Refer to Appendix C.
Management plans		
Acid Sulfate Soil Management Plan for Minor Works	No	N/A
Project-specific Acid Sulfate Soil Management Plan	No	N/A
Dewatering Management Plan	No	N/A
Landscape Management Plan	No	N/A
Vegetation Management Plan	No	N/A
Waste Management Plan	Yes	Yes. Refer to Appendix E.

Checklist of additional assessments, management plans, permits, licences or approvals	Required? (yes/no)	Attached? (yes/no)
Permits/licences/approvals		
A water access licence (WAL) or water supply works approval under the Water Management Act 2000.	No	N/A
NSW DPI Fisheries Permit	Yes	Under Part 7, Division 3 of the *Fisheries Management Act 1994 (FM Act)*, section 200(1) states a local government authority must not carry out dredging work or reclamation work except under the authority of a permit issued by the Minister. Accordingly a dredge and reclamation permit would be applied for prior to works being undertaken. Refer to Appendix G.
NSW DPI Crown Lands – General or Short-term Licence	No	N/A
Consultation		
NSW Environment, Energy and Science (EES)	No	N/A
Transport for NSW	No	N/A
Publishing requirements		
Sensitive information required to be redacted prior to publishing online	Yes	All sensitive information would be redacted from this REF and appendices prior to publishing online.

Link to information on file:

K:\Environmental Approvals\No brief\Tweed River Restoration Uki

8.0 Conclusions

This REF has assessed the proposed activity and any potential impacts. The activity is unlikely to significantly affect the environment, and therefore an EIS is not required.

The activity is unlikely to significantly affect threatened species, populations, ecological communities or their habitats and therefore an SIS and/or BDAR is not required.

9.0 Certification and determination

Table 9.1: Certification by Environmental Scientist preparing the assessment

Certification (person preparing the assessment)	
I certify to the best of my knowledge that: a this REF provides a true and fair review of the proposed activity in relation to its likely effects on the environment. It assesses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed activity b this REF has established that the activity is not likely to significantly affect the environment and an Environmental Impact Statement is not required c the REF has concluded that there will be no significant impacts on matters of national environmental significance or any impacts on Commonwealth land d the proposal should proceed subject to the implementation of all environmental safeguards and management actions identified in the REF and compliance with all other relevant statutory approvals, licenses, permits and authorisations. Note 1: Projects with unacceptable impacts are recommended not to proceed (with reasons stated) or be subject to further investigation and assessment in accordance with an Environmental Impact Statement process. Note 2: The imposition of environmental safeguards and management actions identified in the REF are to minimise any adverse impact the activity may cause and to give effect to the objectives of Part 5 of the Environmental Planning and Assessment Act, 1979.	
Name	[redacted]
Signature	
Position	Environmental Scientist
Date	27/6/2023

Table 9.2: Review and final determination under delegated authority

Review and final determination (person with delegated authority to review and determine the assessment)	
I certify: • to the best of my knowledge that based on the completed REF and my knowledge of the project, the assessment has been adequately completed, and the conclusion as to the likely environmental impact of the project is reasonable and the project can proceed subject to the relevant management measures and environmental safeguards and other relevant authorities described within the REF. • that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading.	
Name	[redacted]
Signature	
Position	Acting Senior Planning Applications Officer
Date	19/07/2023

Table 9.3: Project client signoff

Project client signoff	
I confirm that the: • REF provides an accurate description of the project scope of works • mitigation measures proposed within the REF are budgeted for and form part of the final project scope of works.	
Name	[redacted]
Signature	
Position	Team Leader – Coast & Waterways
Date	28.6.23

Table 9.4: Project manager signoff

Project manager signoff	
I confirm that: • I have reviewed the design and construction footprint as assessed within this REF • the mitigation measures proposed within the REF will be implemented as described during construction and operation of the works • any changes to the project scope of works or disturbance footprint will be communicated to Council's Engineering Division Environmental Scientist, for further assessment (if required).	
Name	[redacted]
Signature	
Position	Project Officer - Waterways
Date	27/06/2023

10.0 Project mitigation measures

Table 10.1: Project mitigation measures

General and/or non-standard mitigation measures	Code
The activity is to be completed in general accordance with the Review of Environmental Factors.	GNS1
All work associated with this activity is to be carried out so as not to cause a nuisance to residents in the locality from noise, water or air pollution.	GNS2
All construction and/or demolition site work including the entering and leaving of vehicles is limited to the following hours, unless otherwise permitted by Council: • Monday to Saturday from 7:00 am to 6:00 pm • No work to be carried out on Sundays or Public Holidays.	GNS3
Written notice shall be given to any affected residences at least 2 weeks prior to any works commencing.	GNS4
All construction personnel working at the site would be inducted prior to commencement of works.	GNS5
A site specific erosion and sediment control plan would be prepared prior to works commencing.	GNS7
All required erosion and sediment control works would be installed and maintained in accordance with the Sediment and Erosion Control Plan and in accordance with the Blue Book – *Managing Urban Stormwater – Soils and Construction.*	GNS8
The contractor should be responsible for preparing a Construction Environmental Management Plan (CEMP) prior to the commencement of works to the satisfaction of Tweed Shire Council's Project Manager or their delegate. The CEMP should be prepared in general accordance with the NSW Government Procurement Guidelines and would include all of the project mitigation measures identified by the project Review of Environmental Factors and amongst other things outline key roles and responsibilities for the implementation of the CEMP. The contractor would be responsible for ensuring the requirements of the CEMP are implemented prior to, during and post construction.	GNS9
Stabilised construction access would be provided to all work areas, including the provision of a 'shake down' area at the entrance to the site where required.	GNS-TRR-1
Construction hours would be limited to 7 am to 6 pm Monday to Friday, 8 am to 1 pm on Saturdays. No works would be undertaken on Sundays or public holidays. Any works proposed outside these times would be subject to an out of hours noise assessment and the further assessment of all feasible and reasonable construction work practices and additional management measures.	GNS-TRR-2

General and/or non-standard mitigation measures	Code
Noise mitigation measures would primarily be limited to minimising noise generated at the source and incorporating management principles into construction works, including: • No swearing or unnecessary shouting or loud stereos/radios would occur on site. • The dragging of objects, dropping of materials from height, throwing of metal items and slamming of doors would be avoided. • Plant operators would be instructed to operate in a manner that does not generate unnecessary noise, such as avoiding excessive revving and minimising compaction where possible. Machines/plant equipment would be turned off when not in use or throttled down to idling. • Using excavator bucket or rock claw to move rocks and other solid objects. • All plant equipment would be maintained in good condition, with all feasible and reasonable acoustic fittings (i.e. residential mufflers and plant enclosures) installed and maintained (refer to AS 2436 – 1981 'Guide to noise control on construction, maintenance and demolition sites'). • Quieter and less vibration emitting construction methods would be implemented where possible. • Reversing of vehicles would be minimised where possible to alleviate the annoyance of beeping reverse alarms (or less tonal 'broadband' or 'quacker' type alarms would be utilised). • Simultaneous operation of noisy plant within discernible range of a sensitive receiver would be avoided. • The offset distance between noisy plant and adjacent sensitive receivers would be maximised where possible.	GNS-TRR-3
All **employees, contractors and subcontractors are to receive a site induction. The induction must include:** • **all relevant project specific and standard noise and vibration mitigation measures** • **relevant approval conditions** • **standard hours of work** • **any limitations on high noise generating activities** • **location of nearest sensitive receivers** • **construction employee parking areas** • **designated loading/unloading areas and procedures** • **site opening/closing times (including deliveries)** • **environmental incident and complaint management procedures.**	GNS-TRR-4
Noise and vibration monitoring • As previously discussed, vibration levels during construction are unlikely to exceed the residential annoyance criteria adopted for the project. Complaint-	GNS-TRR-5

General and/or non-standard mitigation measures	Code
based vibration monitoring would be undertaken during construction as required to confirm site specific vibration levels. • In addition to the above, complaint-based noise monitoring would also be undertaken throughout construction as required to confirm the effectiveness of noise management controls.	
Project specific respite periods would be implemented where possible for high noise activities or on receipt of a complaint deemed reasonable by the Project Manager. The periods could include high noise activities being performed: • between 9 am and 4 pm only • for no longer than a 3-hour period • with a minimum one-hour rest period between any 3-hour period or • a maximum of 3 days construction • one day respite • no longer than 3 construction days in a row	GNS-TRR-6

Community engagement and communication program
• The community engagement program would be overseen by Council's Communication Officer and could include:
  ○ milestone updates in the Tweed Link and/or Council's social media channels
  ○ information on TSC website or on Your Say Tweed pages
  ○ media release
  ○ individual briefings with impacted residents
  ○ letterbox drops and flyers
  ○ signage placed around the construction site
  ○ public onsite meeting with impacted residents
  ○ other communication activities as appropriate.
• All of the above correspondence would include:
  ○ project information and duration
  ○ phone number/email to contact for project enquiries and complaints.
The community engagement program would be in line with the guidelines outlined in the Community Engagement and Participation Plan 2019–2024.
	GNS-TRR-6

Complaints register A complaints register would be maintained by Council during construction and would include: • details of complainant • date and time of the complaint • nature of the complaint • action taken to investigate/rectify the complaint	GNS-TRR-7

General and/or non-standard mitigation measures	Code
• a log of consultation performed with the complainant to resolve the complaint • date and time the complaint was closed.	

Flora and fauna	Code
Pre-construction	
Vegetation that is to be retained, including high conservation zones, is to be clearly identified and delineated from the construction footprint. High-visibility temporary fencing (e.g. scrim or flicker tape) identifying no-go zones is to be installed prior to the commencement of construction works.	F&F1
Where construction works or movement of materials are considered likely to damage trees (trunks, branches or roots), precautionary measures including trunk and branch protection in line with Section 4 of AS4970-2009 would be installed.	F&F2
A pre-clearing site walkover would be undertaken by a suitably qualified Ecologist/Environmental Scientist to survey for any threatened species present within the disturbance footprint which may have been overlooked during previous surveys or established since surveys were undertaken. Pre-clearing surveys would target those threatened species short-listed as most likely to occur on site.	F&F3
In the event that threatened fauna species are identified within the disturbance footprint, construction would avoid disturbance of the individuals and, if necessary, the individuals would be relocated by experienced wildlife handlers.	F&F4
If nests and/or eggs of threatened species are identified within the disturbance footprint, the construction works would be postponed until the eggs are hatched and the hatchlings have dispersed on their own accord or an experienced wildlife handler has safely relocated them.	F&F5
Logs and large branches with hollows are to be identified and their relocation away from disturbance planned prior to the commencement of site activities.	F&F6
All machinery used on site is to be clean – i.e. tracks, vehicle tyres, buckets and attachments are to be visibly free of soil and plant material to minimise the risk of introduction and spread of weed propagules.	F&F9
During construction	
Earthworks are to be managed such that areas outside the scope of the works remain undisturbed as far as possible and vegetation clearing is kept to the absolute minimum required.	F&F10
No construction materials, stockpiles, or construction equipment including heavy vehicles and machinery shall be located or parked within the drip line of trees adjacent the project.	F&F11
All works in regards to the management of vegetation (pruning of roots or branches or removal of identified trees) would be supervised by a suitably qualified arborist.	F&F12
Roots for trees to be retained which are encountered during excavations would be clean cut using a saw or hydro-jet (water knife) and not ripped or torn with an	F&F14

Flora and fauna	Code
excavator or bucket etc. Trimming or pruning of above ground branches or limbs would be undertaken with a saw.	
Care would be taken to replace dead wood and retain dead trees in areas of retained vegetation for wildlife habitat values. Replacement locations would be determined in consultation with Project Environmental Scientist or an ecologist.	F&F17
Remove all waste containing weeds and seeds from the site and dispose of so that the spread of weeds is minimised.	F&F18
When controlling weeds, refer to measures stipulated by the *New South Wales Weed Control Handbook – A guide to weed control in non-crop, aquatic and bushland situations.*	F&F19
If aquatic snags are present within the disturbance footprint at the time of construction, they require relocation in accordance with the following guidelines: • Snags are to be realigned and/or relocated to a zone of low velocity and at an angle of 20^{o} to 40^{o} to the bank facing downstream. The location is to be determined in consultation with the Project Environmental Scientist. • Snags with rootballs are to be aligned so that the root-ball is against the bank and at the upstream end.	F&F20
Post-construction	
Areas which are disturbed during construction and not permanently transformed are to be revegetated.	F&F22

Erosion and sediment control	Code
Pre-construction	
All required erosion and sediment controls would be in place prior to the commencement of work and maintained until all works are completed.	ESC1
During construction	
Where practicable, construction works would be staged to minimise the area of disturbance at any one time.	ESC2
Works would be stopped if unsuitable weather conditions are predicted, such as during and after heavy rain.	ESC4
The condition of sediment control structures would be monitored and maintained in proper working order throughout the time they are in place. They would be kept clear of debris at all times and cleared of sediment if filled >50% capacity.	ESC5

Erosion and sediment control	Code
Stockpile sites would be located in existing cleared areas away from drains and surface water flows and protected with an upslope diversion bund and down slope sediment fencing (if required).	ESC6
'Clean' run-on water would be diverted around the disturbance area.	ESC7
Construction plant should be floated on-site using established access roads/tracks or areas previously cleared of vegetation.	ESC8
In the event that significant tracking of mud and soil occurs on adjacent roads, cleaning of the road will be undertaken as soon as practically possible.	ESC10
Post-construction	
Following completion of construction works, the site would be cleared of all debris, waste soil and foreign matter.	ESC11
All disturbed surfaces would be reinstated and stabilised as soon as possible after completion using turf and/or grass seed.	ESC12
All temporary erosion and sediment control structures would be removed once the site is stabilised.	ESC13

Water quality management	Code
During construction	
In-stream sediment fences are to be provided at all work sites where riparian or in-stream works are to be undertaken and sediment is to be mobilised with a potential endpoint within the waterway.	WQ1
In-stream sediment fences are to remain in place throughout the duration of works.	WQ2
In-stream sediment fencing is to cover the entire depth of the water column and is to be weighted or installed in a manner such that the bottom of the sediment fence is flush with the riverbed directly downstream of the area of works.	WQ3
In-stream sediment fencing is not to cover the full width of the stream in order to allow for fish passage.	WQ4
In-stream sediment fencing is to surround the work footprint and be installed as close as possible to the work area.	WQ5
In-stream sediment fencing is to consist of geofabric of suitable mesh size such that the smallest anticipated sediments will be trapped within the mesh.	WQ6
In-stream sediment fences can either be supported on a floating boom or staked in place with star pickets or similar. Floating booms are appropriate in deeper channels	WQ7

Water quality management	Code
and/or in slow moving streams. Stakes are more appropriate in shallow streams and/or where increased velocity is experienced.	
The condition of sediment control structures would be monitored and maintained in proper working order throughout the time they are in place. They would be kept clear of debris at all times and cleared of sediment if filled >50% capacity.	WQ8
There is to be no release of dirty water into drainage lines and/or waterways.	WQ9
Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis to identify any potential spills or deficient erosion and sediment controls.	WQ10
Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc.) entering drain inlets or waterways.	WQ11
All materials including paints, coatings and fuels used when working over a waterway are to be appropriately contained and hand held tools tethered correctly.	WQ12
During construction, sediment from silt curtains will be regularly cleared, and weather forecasts will be monitored to reduce the potential for sediment release during flood events.	WQ17
To minimise the risk of water pollution and disturbance to the streambed substrate, machinery is not to enter or work from the waterway without prior written approval.	WQ18
To avoid fines, clay and other sediments unnecessarily entering the waterway, only clean rock is to be used for construction works within the waterway.	WQ19

Land use and amenity	Code
During construction	
The proposed activity would be managed such that the development footprint is limited to the extent necessary to complete the scope of works.	LUA1
All plant, equipment, materials and waste would be removed from the site at the completion of works.	LUA2

Public access	Code
To ensure public safety during works, standard construction site access restrictions would apply.	PA1
The works alignment would be fenced in nominated locations to restrict public access.	PA2

Public access	Code
Signage would be utilised along the alignment to direct and inform the public regarding access to and around the site.	PA4

Noise and vibration	Code
Pre-construction	
Closely affected residents would be notified accordingly of the works being performed in close proximity and informed of the process for making a complaint. For this project, complaints would be made to the constructor.	N&V1
During construction	
Ensure site workers are aware of the process for receiving complaints and direct complainants to the responsible site supervisor.	N&V2
The operation of plant and equipment would be restricted to standard hours of 7:00 am to 6:00 pm Monday to Saturday. No work would be undertaken on Sunday or public holidays.	N&V3
Trucks and equipment would not arrive or queue outside the site before 7 am Monday to Saturday.	N&V4
Operating periods for particularly noisy activities (i.e. rock breaking/drilling, if required) would be reduced where possible to provide respite periods.	N&V5
Machines/equipment would be turned off when not in use or throttled down to a minimum.	N&V6
Reversing of vehicles would be minimised where possible to alleviate the annoyance of beeping reverse alarms (or less tonal 'broadband' or 'quacker' type alarms would be utilised).	N&V7

All reasonable steps shall be taken to muffle and acoustically baffle all plant and equipment. In the event of complaints from the neighbours, which Council deem to be reasonable, the noise from the construction site is not to exceed the following:
• Short Term Period – 4 weeks.
  ○ LAeq, 15 min noise level measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 20dB(A) at the boundary of the nearest likely affected residence.
• Long term period – the duration.
  ○ LAeq, 15 min noise level measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 15dB(A) at the boundary of the nearest affected residence.
	N&V8

Noise and vibration	Code
All plant would be maintained in good condition, with all reasonable and feasible acoustic treatments (i.e. residential mufflers and plant enclosures) installed and maintained (refer to AS 2436 – 1981 'Guide to noise control on construction, maintenance and demolition sites').	N&V9
Any stationary equipment (e.g. generators) would be located as far as possible from residential receptors.	N&V10
Plant operators would be instructed to operate equipment in a manner that does not generate unnecessary noise, such as: • avoiding excessive revving • avoiding dragging objects or dropping objects from a height • minimising impact with solid objects where possible • using excavator bucket heads or rock claw attachment to move solid objects • using excavator bucket, claw or rock ripper pick in preference to rock drillers or splitters, where possible • turning off machines/plant equipment when not in use or throttled down to idling.	N&V11
Complaint based noise monitoring would be performed throughout construction as required to confirm the effectiveness of noise management controls.	N&V12
A noise complaint register would be maintained throughout construction. The register would record all complaints including: • Complainant contact details • Source/type of noise causing disturbance • Time and duration of noise causing disturbance • Times when the noise would cause least disruption • Measures taken to address the complaint Complaints handling is to occur in a prompt and responsive manner.	N&V13
Where there are complaints about noise from an identified work activity, it would be reviewed and, where feasible and reasonable, actions additional to those in place implemented to minimise noise output and disruption to sensitive receptors (e.g. reschedule activity causing disturbance to a time which causes least disruption to the complainant and other receptors).	N&V14

Air quality management	Code
During construction	
All plant and machinery would be serviced at regular intervals to minimise exhaust emissions.	AQ1
The constructor would observe local meteorological conditions and predicted forecasts on a daily basis and prepare site for extreme weather events (i.e. high winds, rainfall).	AQ2
Works would be staged, where practicable, to minimise the area of disturbance at any one time.	AQ3
All necessary precautions shall be taken to minimise impacts from dust during construction works and from construction vehicles.	AQ4
Dust dispersion would be managed via stockpile control (e.g. soil stockpiles covered during high wind conditions), erosion and sediment controls, and wetting down if required.	AQ5
Any transport trucks would be covered during journeys to and from the site.	AQ6
Vehicles would be switched off when not in use.	AQ7
Dust screens will be considered where necessary to protect adjacent residences from wind-blown dust.	AQ8
All stockpiles, exposed areas, unsealed trafficable areas and compound areas will be covered where practicable (using plastic, mulch, hydromulch, etc.) or wet down as required to minimise wind-blown and traffic generated dust. Wetting down of these areas should not be done to the extent that run-off occurs.	AQ9
Post-construction	
Disturbed areas would be stabilised once works are complete, or progressively where appropriate.	AQ10

Traffic management	Code
Pre-construction	
Where a Traffic Management Plan is required it shall be submitted to Council for approval not less than 7 days prior to commencement of works.	TM2
During construction	

Traffic management	Code
Where works would result in delays to traffic, where possible, they would be scheduled to occur outside of morning and afternoon peak traffic periods and the public would be notified in advanced.	TM3
Parking for construction workers would be accommodated within the construction footprint and existing cleared areas within the nearby road reserve.	TM4
Traffic would be managed by traffic controllers throughout construction.	TM5
Where possible, all loading and unloading operations will be conducted within the internal construction zone to alleviate the need for lifting materials from off the street.	TM6

Contaminated lands	Code
During construction	
Works are to cease immediately if any potential source of contamination is uncovered during works (e.g. chemical drums). In such an instance remediation in accordance with a Council approved Remediation and Validation Action Plan would be required.	CLM1
All imported fill material shall be from an approved source. Prior to commencement of construction, details of the source of the fill, description of the material, and evidence that the material is free of contaminants, must be produced.	CLM2

Hazard management	Code
During construction	
Appropriate spill kits, advocated for use in association with fuels and chemicals are to be maintained on-site. These are to include spill booms and other methods aimed at the containment of fuels and chemicals spilled within the aquatic environment.	HAZ5
Fuels and chemicals are to be stored off-site, however, if required to be stored on-site, they are to be located in a bunded area away from drainage lines.	HAZ6
No refuelling is recommended within the subject site. If however, refuelling is required at the subject site, areas designated for the storage, refuelling and maintenance of plant are to be established where native vegetation has previously been cleared and at least 30 m from a waterway.	HAZ7
Forecast checks of the Bureau of Meteorology site would be undertaken daily. In the event that heavy rain is predicted, arrangements are to be made immediately to remove any plant and equipment from within the banks of the waterway prior to the	HAZ8

Hazard management	Code
rain event. All plant and equipment would be removed to higher ground above the 1 in 100-year flood level.	
In the event of flooding, no workers would be directed into flood waters.	HAZ9
Any debris and spoil accumulated within the works site as a result of flooding would be removed to the designated stockpile area.	HAZ10
All environmental controls would be reinstated as soon as possible following flooding.	HAZ11

Cultural heritage management	Code
During construction	
If an Aboriginal object or objects, or any cultural heritage material is identified during the works, all works would stop immediately and the Manager Infrastructure Deliver, Tweed Shire Council (TSC) notified. The TSC contact is to advise the Tweed Byron Local Aboriginal Land Council (TBLALC) Aboriginal Sites Officer (on 07 5536 1926) and Office of Environment and Heritage (OEH). No works or development may be undertaken until the required investigations have been completed and any permits or approvals obtained, where required, in accordance with the *National Parks and Wildlife Act 1974*. It is possible that in such a case there may be a necessity to apply for an AHIP and further investigations may be required. The *National Parks and Wildlife Act* requires that, if any person finds an Aboriginal object on land and the object is not already recorded on AHIMS, they are legally bound under Section 89A of the Act to notify OEH as soon as possible of the object's location.	CH1
In the event that objects suspected of being of Aboriginal Cultural Heritage significance are uncovered, the TSC ACHMP unexpected finds procedure must be followed.	CH2
If human remains are found during the works, then all works shall cease immediately. The area must be secured within an exclusion zone to prevent unauthorised access and the NSW Police and OEH must be informed as soon as possible.	CH3
If non-aboriginal heritage is discovered, work should stop and the item demarcated. An in-situ heritage assessment is required to determine whether the item is a relic. If the item is concluded to be a relic, the NSW Heritage Council are to be contacted as soon as practical. The NSW Heritage Council would advise the appropriate course of action to be taken. N.B. The Heritage Act 1977 defines '*Relic'* as meaning any deposit, artefact, object or material evidence that: (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and is of State or local heritage significance.	CH4

Biosecurity management	Code
Suspicious sightings of red imported fire ants or their mounds that have been identified within a site must be reported to NSW Department of Primary Industries immediately on 1800 680 244 or via their online form https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants. If red imported fire ants are suspected, do not: • disturb the ants or nests • treat the infestation yourself. If red imported fire ants are suspected, do (if safe to do so): • take a photo of the suspicious ants including a scale (use coin or key) and attach it to the report • keep a sample in a jar or zip lock sandwich bag in case it needs to be submitted for further investigation	BM1
Red imported fire ants are regulated as prohibited matter under the *NSW Biosecurity Act 2015*. Their possible movement and spread can be in or on hay or straw bales, turf, agricultural and earth moving equipment, organic mulch including manure, soil and potted plants. • To move hay, straw bales, turf agricultural and earth moving equipment into NSW from or through the fire ant biosecurity zones in Queensland it must be accompanied by a Plant Health Certificate. • To move soil and organic mulch including manure into NSW from or through the fire ant biosecurity zones in Queensland it must be accompanied by either a Plant Health Certificate or a Biosecurity Certificate. • To move potted plants into NSW from or through the fire ant biosecurity zones in Queensland it must be accompanied by either a Plant Health Certificate, a Plant Health Assurance Certificate or a Biosecurity Certificate.	BM2
Prior to the use of materials and equipment that has travelled through or from a Queensland biosecurity zone, Project Managers are to ensure that contractors supply the necessary certificates for any of the materials and equipment.	BM3
Any requirements identified by the NSW Department of Primary Industries for prohibited matter must be complied with.	BM4

Waste minimisation and management	Code
During construction	
All waste materials generated by the project should be managed in accordance with the project Waste Management Plan.	WM1

Waste minimisation and management	Code
All waste materials generated by the project should be managed in accordance with the project Waste Management Plan. A preliminary waste management plan is included in Appendix E and will be further updated and communicated at the pre-start construction meeting following waste classification testing of soil materials that would be encountered during construction.	WM2
All reasonable efforts will be made to avoid and minimise waste and to reuse or recycle where possible.	WM3
Separate waste and recycling bins will be provided on site for the removal of workers and building rubbish.	WM4
All waste bins on site will have self-closing lids preventing waste from being airborne.	WM5
All general rubbish and construction waste would be removed from the site and disposed of in an appropriate bin or Council waste recovery facility.	WM6

11.0 Figures and plates

Figure 1: Site location (pink polygon = subject site)

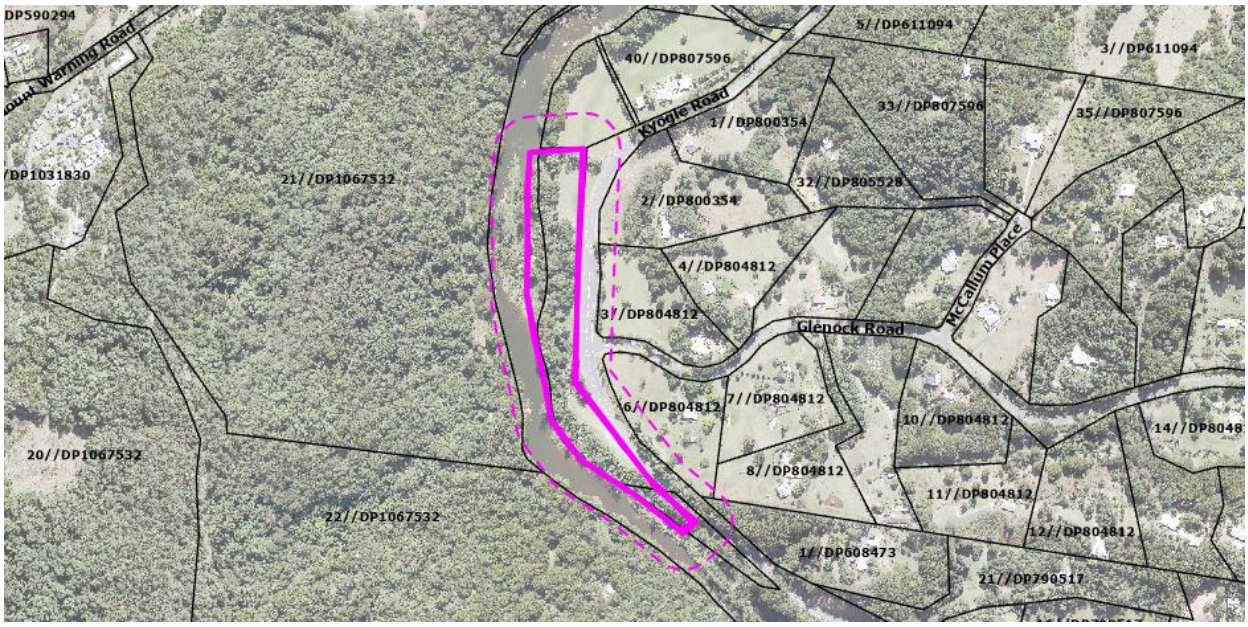


Figure 2: Subject site (pink polygon; with 50 m study area = dashed pink polygon)

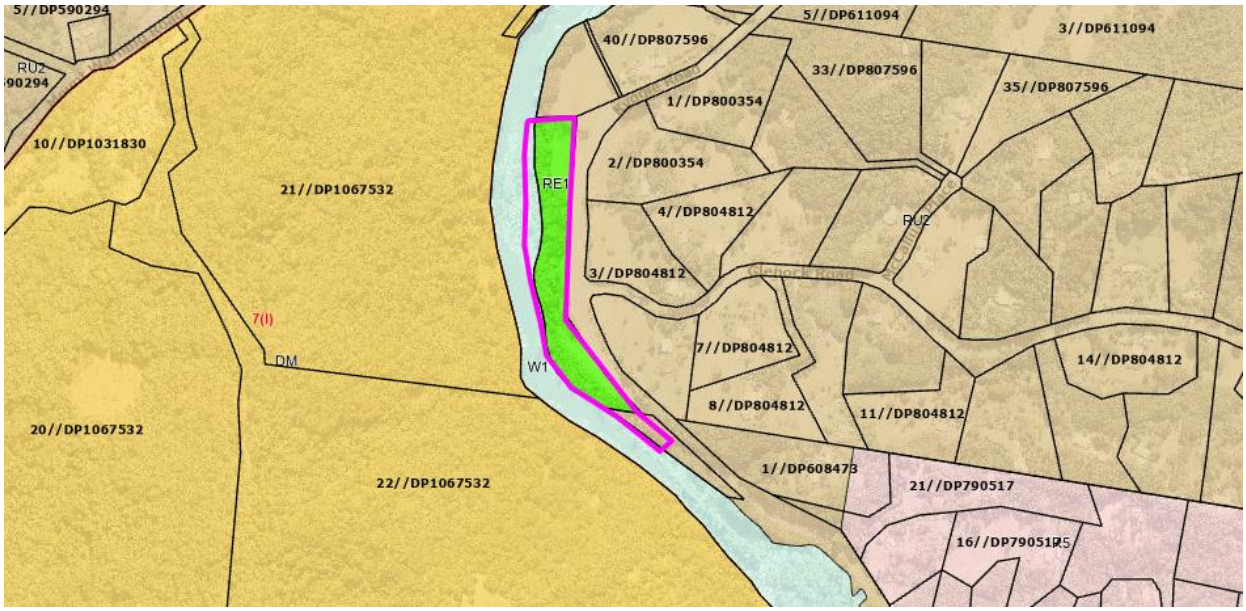


Figure 3: Land zoning (pink polygon = subject site); TLEP 2014 zoning: RE1 = Public Recreation; W1 = Natural Waterways; RU2 = Rural Landscape; R5 = Large Lot Residential; DM + Deferred Matter (TLEP 2000 zoning: 7(l) = Environmental Protection (Habitat)).

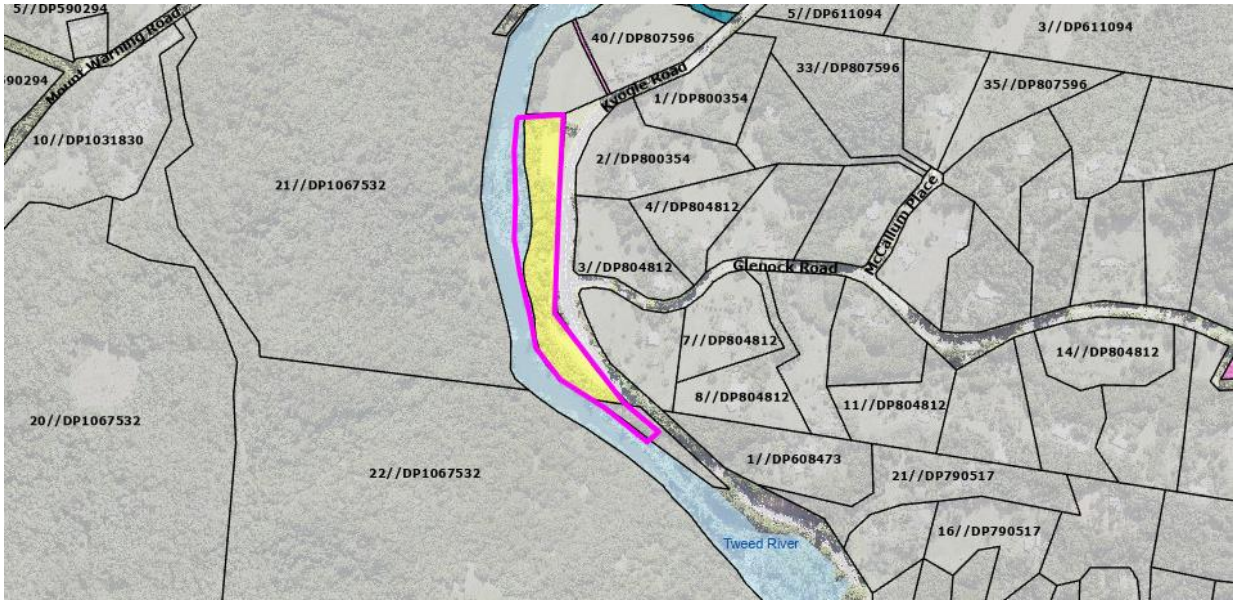


Figure 4: Land tenure (pink polygon = subject site); blue shading = waterway; yellow shading = Community Land (Council Owned); grey shading = freehold.

Aerial imagery – the centre of the subject site is identified by white cross hairs on the following aerial imagery

Figure 5: Historic aerial imagery from 1961 (source: Historical Imagery Viewer)

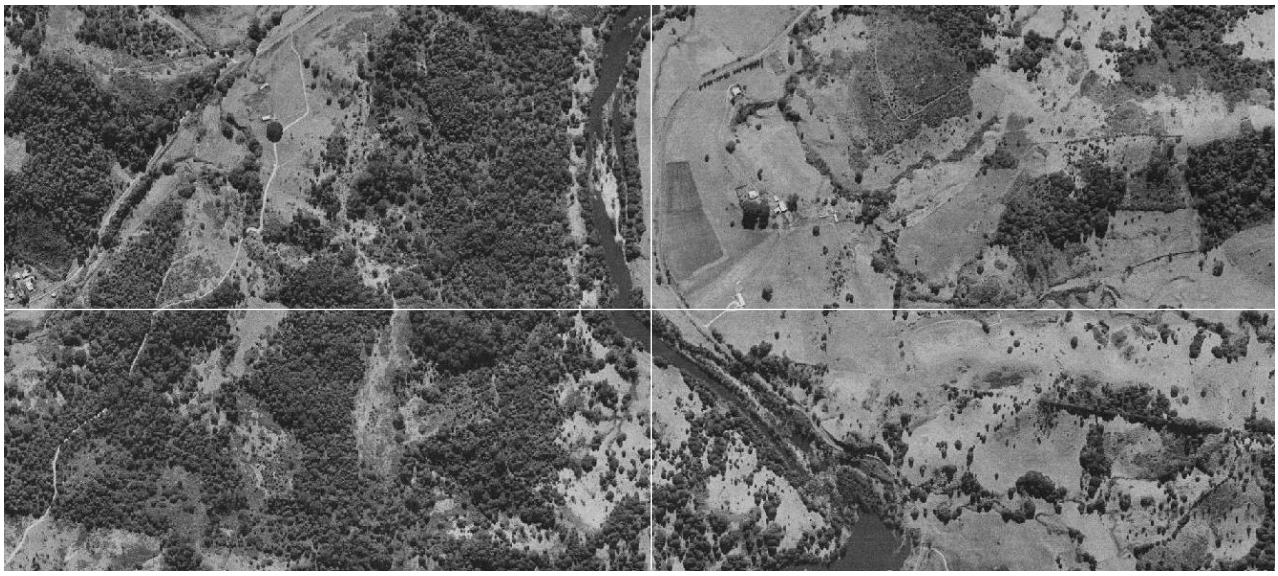


Figure 6: Historic aerial imagery from 1970 (source: Historical Imagery Viewer)

Figure 7: Historic aerial imagery from 1986 (source: Historic Imagery Viewer)

Figure 8: Historic aerial imagery from 1990 (source: Historic Imagery Viewer)

Figure 9: Historic aerial imagery from 1996 (source: Historic Imagery Viewer)

Figure 10: Historic aerial imagery from 2004 (source: Weave)

Figure 11: Historic aerial imagery from 2009 (source: Weave)

Figure 12: Historic aerial imagery from 2016 (source Nearmap)

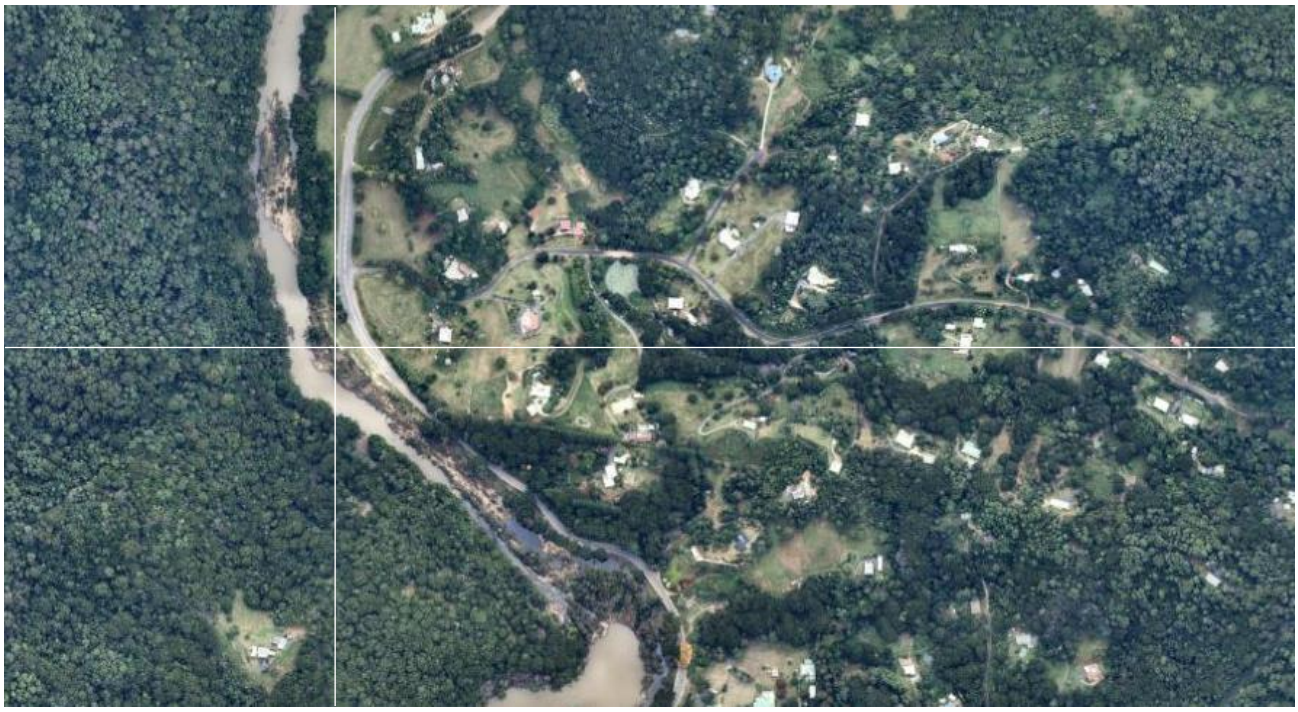


Figure 13: Historic aerial imagery from April 2017—1-month post-flood (source: Nearmap)

Figure 14: Historic aerial imagery from July 2021 (source: Nearmap)

Figure 15: Historic aerial imagery from June 2022—3 months post-flood (source: Nearmap)

Figure 16: Recent aerial imagery from April 2023 (source: Nearmap)

Plate 1: Southern section of site looking upstream

Plate 2: Southern section of site looking downstream

Plate 3: Central section of site looking downstream – evidence of loss of land and vegetation

Plate 4: Evidence of erosion and land loss, exotic species regenerating

Plate 5: Northern end of subject site looking downstream, erosion of bank and regenerating exotic species

Plate 6: Central section of site looking upstream, expanse of flood damage with regenerating native and exotic species

12.0 References

Department of Environment and Climate Change NSW (DECC) (2007). *Threatened species assessment guidelines: The assessment of significance*.

Department of Environment, Climate Change and Water NSW (DECCW) (2011). *Road Noise Policy*. NSW Government, March 2011.

Department of Environment and Climate Change NSW (DECC) (2009). *Guidance for Licensing of Mineral-sand Mining that Generates Radioactive Residues*. NSW Department of Environment and Climate Change.

Department of Planning and Environment (DPE) (2022). *Guidelines for Division 5.1 assessments – For publication*. State of New South Wales.

Department of Primary Industries (DPI) (2013). *Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management (2013 update)*. Published by the NSW Department of Primary Industries, a part of the Department of Trade and Investment, Regional Infrastructure and Services.

Morand, D.T. (1996). *Soil Landscapes of Murwillumbah – Tweed Heads 1:100 000 Sheet Report*. Department of Land and Water Conservation, Sydney.

Office of Environment and Heritage (OEH) (2012). *Tweed Vegetation Management Strategy 2012*. Prepared for Tweed Shire Council.

Stone, Y., Ahern, C.R., and Blunden, B. (1998). *Acid Sulfate Soil Manual 1998*. Acid Sulfate Soil Management Advisory Committee, Wollongbar, NSW, Australia.

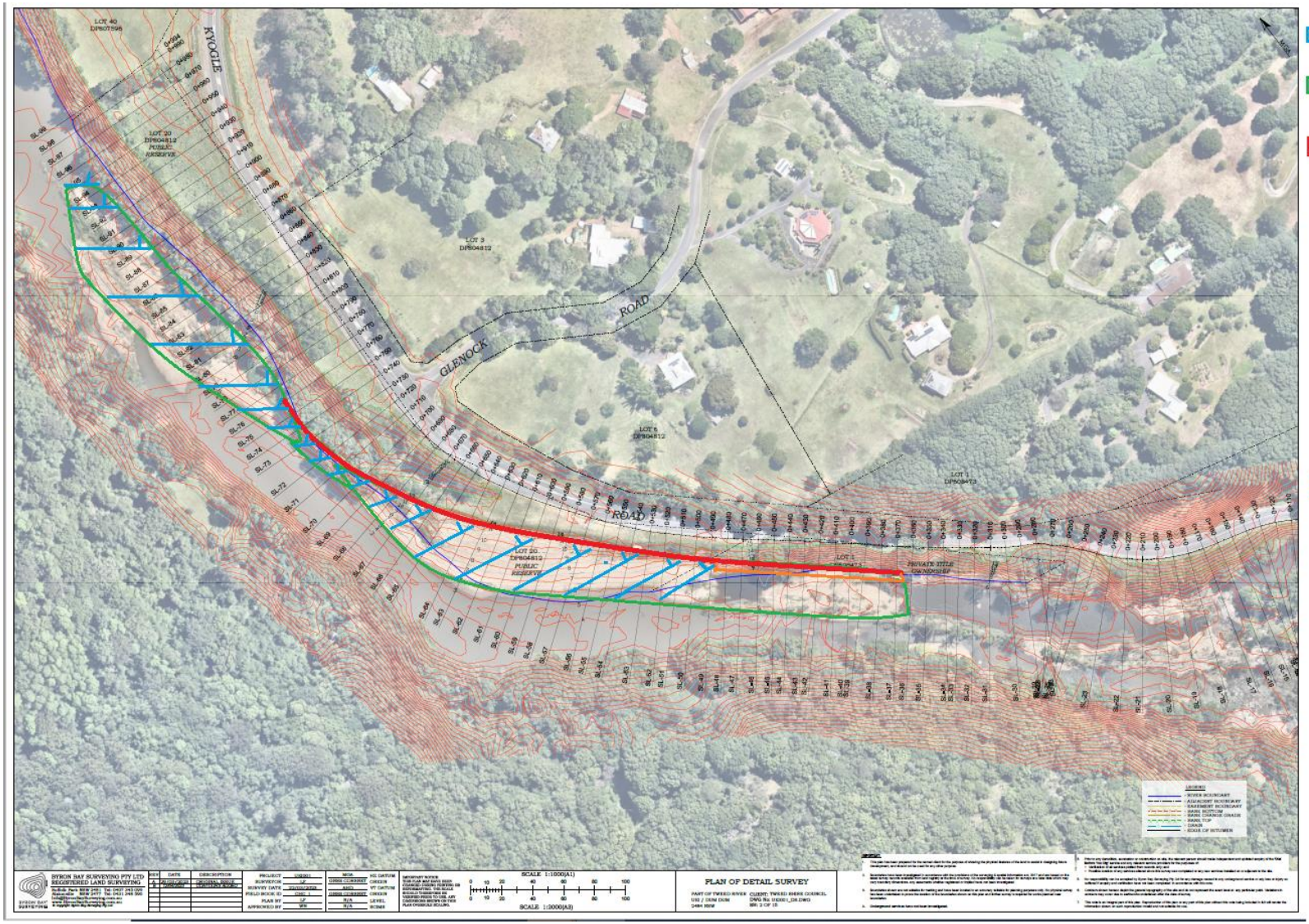
Tweed Shire Council (TSC) (2022). *Council's sustainable operations*. https://www.tweed.nsw.gov.au/environment/climate-sustainability/sustainable-operations . Accessed 7 June 2022.

Tweed Shire Council (TSC) (2018). *Tweed Scenic Landscape Strategy – Draft for Exhibition*. Murwillumbah, NSW, Australia.

Tweed Shire Council (TSC) (2017). *Tweed Shire Council Renewable Energy Action Plan – Electricity in Council facilities*. Murwillumbah, NSW, Australia.

13.0 Appendices

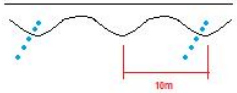
Appendix A Design plans



SINGLE PIN ROW 1m HIGH 0.5m SPACING

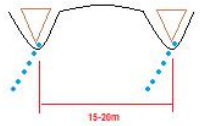
PIN FIELD 1m HIGH 1-1.5m SPACING

CORRUGATED ROCK REVETMENT D50 750mm



AND/OR

A-FRAME DEFLECTOR



ROCK GIRDLES D50 1000mm BED LEVEL OR DOUBLE PIN ROW 1m HIGH 0.5m SPACING STAGGERED BETWEEN BAR AND REVETMENT

EROSION AND SEDIMENT CONTROL NOTES

Progressive ERSED plans shall be developed and implemented as required by the Site Supervisor based on this plan and the following principles and standard site control measures.

Stabilise access to all work areas during construction
× Limit entry and exit points to and from the construction site including temporary lay-down compound locations for vehicles, plant and machinery.
× Sediment should not be tracked off-site onto roads or surrounding verge areas.
× Unnecessary disturbance of verge areas outside the disturbance footprint should be avoided by establishing no-go zones and restricting vehicle and machinery access.
Refer to Standard Drawing: SD 6-14

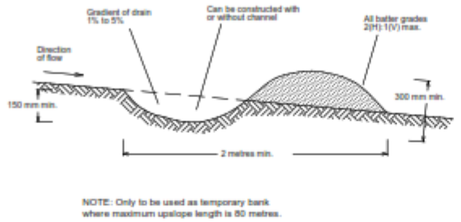
Minimise the extent and duration of ground and estuary disturbance
× Construction works to be managed including the establishment of no-go zones outside the disturbance footprint such that areas outside the scope of works remain undisturbed as much as possible.
× Maintain vegetation adjacent infrastructure that directs stormwater into waterways e.g. maintain roadside grass strip adjacent roads where possible.
× Minimise rock and woody debris removed from waterways in order to complete in-stream works.
× Aim to remove in-stream obstructions to works by picking out items rather than excavating material.

Control stormwater flows onto, through and from the site
× Divert 'clean' run-on water from 'dirty' (e.g. turbid) construction area water runoff.
× Construction area water runoff should be directed toward sediment filtration devices that reduce sedimentation prior to discharge from the works area.
× Construct permanent drainage structures early in the project including:
o Kerb and guttering
o Swale drains.
Refer to Standard Drawings: SD 5-4, SD 5-5,

Works to be staged with an emphasis placed on the progressive stabilisation of disturbed areas as works progress
× Stage the works by removing ground cover and completing work in stages, moving onto new sections following completion of the previous stage.
× Control dust and erosion by progressively stabilising disturbed areas.
× Ground stabilisation works shall be carried out as soon as possible following the completion of stages including reinstating roads and turf.
× All disturbed verges shall be established by revegetating with seed mix or turf as soon as practicable.
× Use topsoil generated by the project to ensure the success of revegetation works.
Refer to Standard Drawings: SD 4-2, SD 7-1

Use sediment control measures as the final measure to prevent off-site damage
× Soil and water management techniques should prevent erosion in the first instance.
× All rock used on the project should be washed and free from fines.
× The installation of sediment controls nevertheless to be installed prior to any ground disturbance or clearing.
× Ensure formed areas such as bitumen roads are swept and kept clean prior to rain or at the end of shift.
× Material stockpiles should be located in low hazard areas a minimum of 30m from waterways and away from stormwater channels. Stockpiles should be managed using vegetative cover, stormwater diversion and sediment fencing where required. Temporary stockpiles remaining longer than 10 days should be vegetated with seed mix.
Refer to Standard Drawings: SD 4-1, SD 6-8,

Inspect and maintain controls
× Ensure erosion and sediment control measures are progressively and continually implemented during construction.
× Initiate a program to regularly maintain (every 24 hours) erosion and sediment control measures including the removal of built up sediment in controls. Sediment control measures should be kept clear of debris at all times and cleared of sediment if filled to >50 % capacity.
× Arrange inspections by an Environmental Scientist to review and update control measures in consultation with the Site Supervisor. Additional inspections should be conducted during and/or immediately following significant rainfall events to monitor the effectiveness of control measures.
× All erosion and sediment control measures should be maintained until works are completed and disturbed areas have stabilised.
× Monitor 7 day rain forecast to determine the timing of works or preparation of ESC measures for forecast rain events.

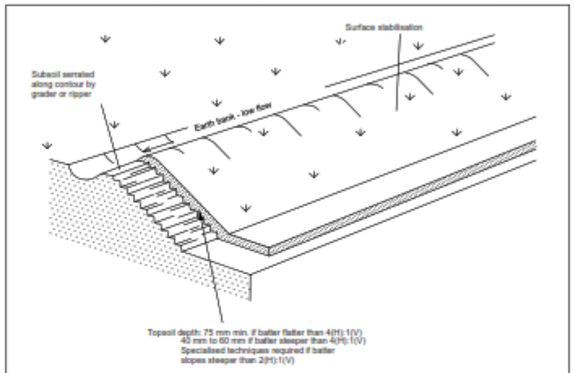


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

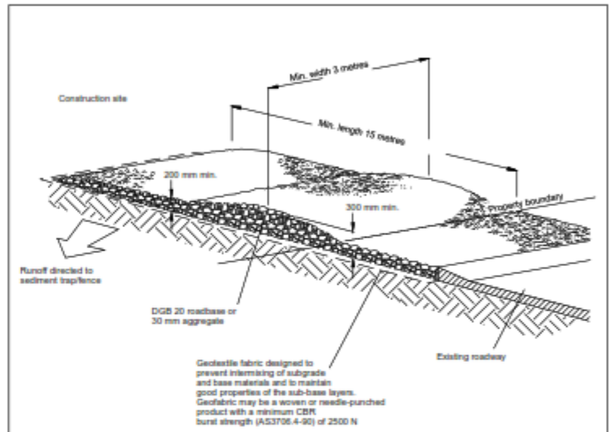
EARTH BANK (LOW FLOW) SD 5-5



Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

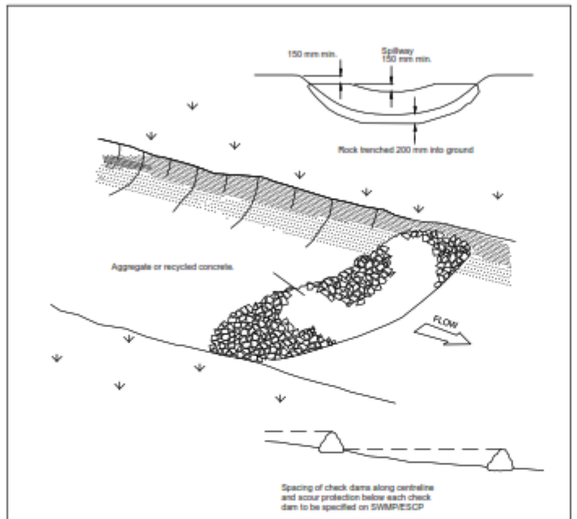
REPLACING TOPSOIL SD 4-2



Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200 mm thick pad over the geotextile using road base or 30 mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

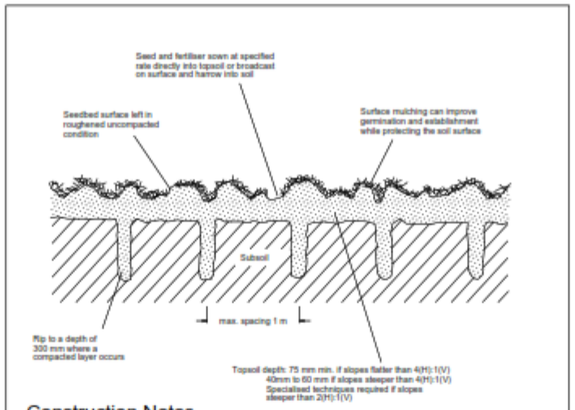
STABILISED SITE ACCESS SD 6-14



Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

ROCK CHECK DAM SD 5-4



Construction Notes

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

SEEDBED PREPARATION SD 7-1

APPROVAL
ON BEHALF OF COUNCIL
ENVIRONMENTAL SCIENTIST
DATE: 18.5.2023

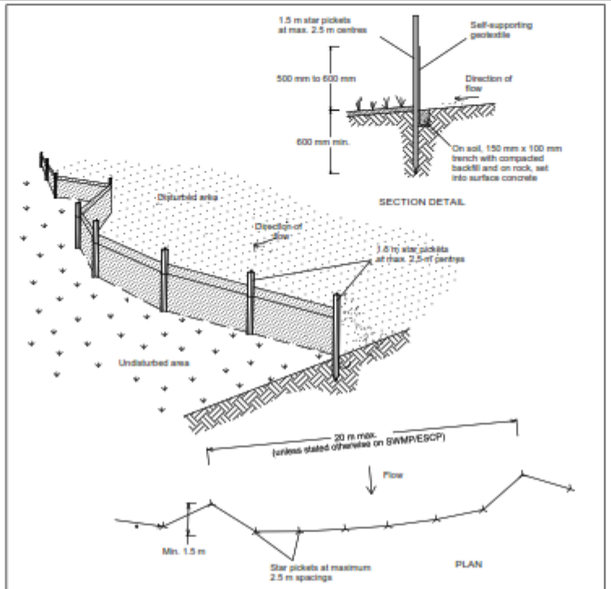
PLAN TITLE:

EROSION AND SEDIMENT CONTROL PLAN

DESIGN UNIT
COUNCIL OFFICES
TUMBULGUM ROAD,
MURWILLUMBAH NSW 2484.
PHONE 02 66702400
EMAIL tsc@tweed.nsw.gov.au
WEBSITE www.tweed.nsw.gov.au
TWEED SHIRE COUNCIL

PROJECT:

TWEED RIVER FLOOD RESTORATION WORKS, DUM DUM & UKI—TWEED SHIRE

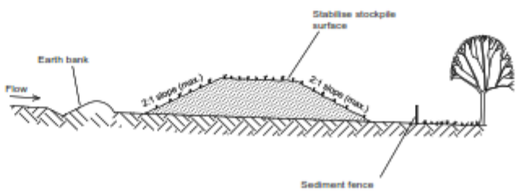


Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE SD 6-8

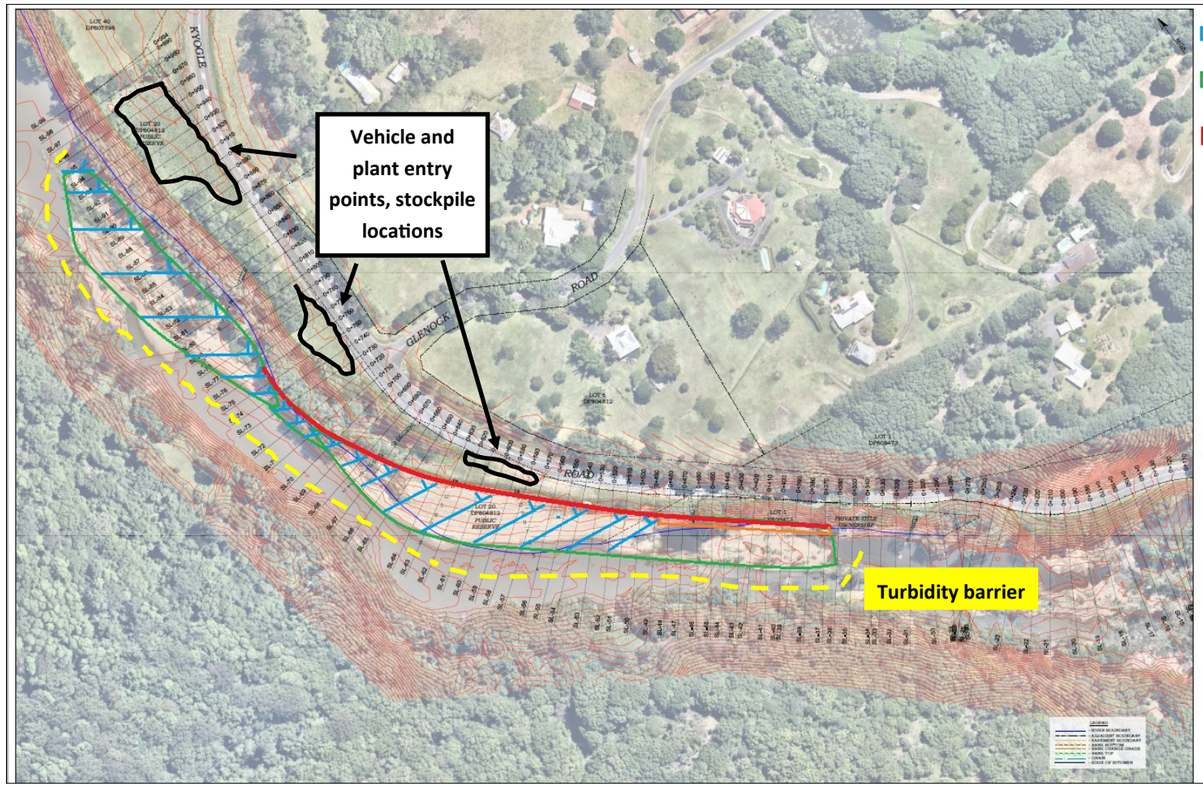
lan



Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

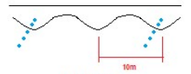
STOCKPILES SD 4-1



SINGLE PIN ROW 1m HIGH 0.5m SPACING

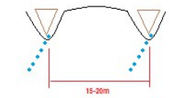
PIN FIELD 1m HIGH 1-1.5m SPACING

CORRUGATED ROCK REVETMENT D50 750mm

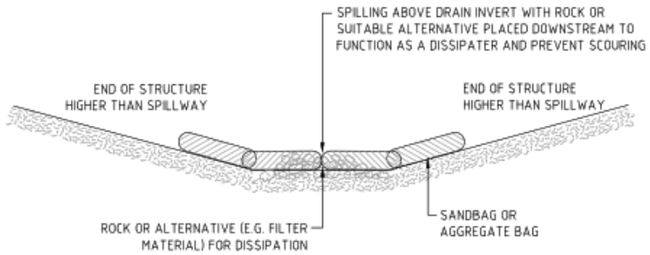


AND/OR

A-FRAME DEFLECTOR

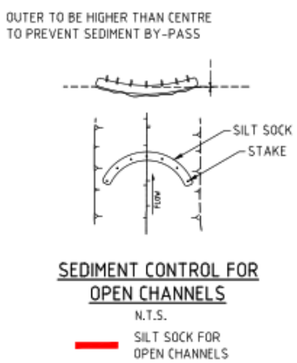


ROCK GIRDLES D50 1000mm BED LEVEL OR DOUBLE PIN ROW 1m HIGH 0.5m SPACING STAGGERED BETWEEN BAR AND REVETMENT

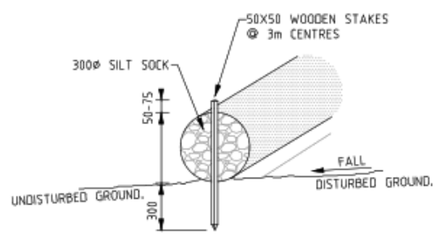


TYPICAL MEDIAN/TABLE DRAIN APPLICATION

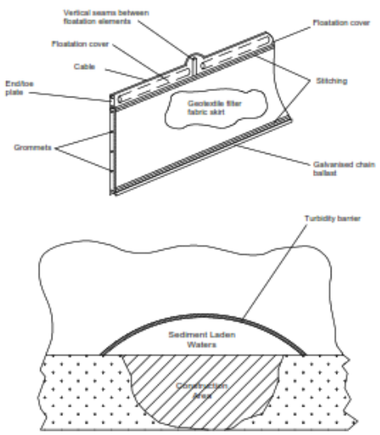
APPROVAL
ON BEHALF OF COUNCIL
ENVIRONMENTAL SCIENTIST
DATE: 18.5.2023



SEDIMENT CONTROL FOR OPEN CHANNELS
N.T.S.
SILT SOCK FOR OPEN CHANNELS



SILT SOCK DETAIL
N.T.S.



Construction Notes

1. Use turbidity barriers only where high flows are unlikely to remove accumulated sediment and/or move the curtain significantly.
2. Where the barrier is to remain in place for more than one month, ensure the floatation cover is a UV-resistant, durable material.
3. Use only closed cell foam or foam-filled PVC piping as floatation elements. Do not use unfilled pipes.
4. Use only woven or heat-set non woven geotextiles. Needle-punched, non woven geotextiles can become fouled with debris that fray and delaminate them as they move with the waves or currents.
5. Remove captured sediment before the barrier is decommissioned.
6. In tidal areas, ensure the barrier can rise and fall without being moved from its position.

TURBIDITY BARRIER SD 6-10

PLAN TITLE:

EROSION AND SEDIMENT CONTROL PLAN

DESIGN UNIT

COUNCIL OFFICES
TUMBULGUM ROAD,
MURWILLUMBAH NSW 2484.

PHONE 02 66702400
EMAIL tsc@tweed.nsw.gov.au
WEBSITE www.tweed.nsw.gov.au

TWEED SHIRE COUNCIL

PROJECT:

TWEED RIVER FLOOD RESTORATION WORKS, DUM DUM & UKI—TWEED SHIRE

Appendix B EPBC Act Matters of National Environmental Significance

Table B1 Matters of National Environmental Significance and their relevancy to the proposed activity

Matter of National Environmental Significance	Relevancy to the proposed activity
World Heritage Properties	One identified: • Gondwana Rainforests of Australia, Qld This World Heritage Property is not present at the subject site and the proposed works would not impact this area.
National Heritage Places	One identified: • Gondwana Rainforests of Australia, NSW This National Heritage Place is not present at the subject site and the proposed works would not impact this area.
Wetlands of International Importance (RAMSAR Wetlands)	None.
Great Barrier Reef Marine Park	None.
Commonwealth Marine Areas	None.
Listed Threatened Ecological Communities	Six identified: • Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community • Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland • Dunn's white gum (*Eucalyptus dunnii*) moist forest in north-east New South Wales and south-east Queensland • Grey box-grey gum wet forest of subtropical eastern Australia • Lowland Rainforest of Subtropical Australia • Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions These vegetation communities are not mapped as being present at the site. The proposed works have been designed to stabilise the waterway bank and therefore protect vegetation upstream and downstream and would therefore not impact upon any TECs.
Listed Threatened Species	106 identified. Given the disturbed nature of the site, lack of vegetation and that works would be undertaken within an existing disturbed area, threatened species identified from the search are considered unlikely to be impacted by the proposal.
Listed Migratory Species	38 identified. All species are marine species (birds, cetaceans, sharks and turtles) or terrestrial or wetland birds. These species are highly mobile and the disturbance footprint represents a small area relative to their home ranges. Furthermore, the extent and condition of suitable habitat available for these species which would be altered as a result of the proposal is

	negligible. Accordingly, these species are not expected to be significantly impacted upon.

Additional matters protected under the EPBC Act identified in the EPBC Protected Matters report are summarised and the relevancy of these matters to the proposal are discussed in Table B2.

Table B2 Additional matters protected under the EPBC Act and relevancy to the proposed activity

Additional matter protected under the EPBC Act	Relevancy to the proposed activity
Commonwealth Lands	Five identified: • Commonwealth Land – Australian Telecommunications Commission [11245] NSW • Commonwealth Land – Australian Telecommunications Commission [11246] NSW • Commonwealth Land – Australian Telecommunications Corporation [11249] NSW • Defence – MURWILLUMBAH TRAINING (GRES) DEPOT; 41 RNSWR MURWILLUMBAH [10059], NSW • Defence – MURWILLUMBAH TRAINING (GRES) DEPOT; 41 RNSWR MURWILLUMBAH [10058], NSW The subject site is not with this Commonwealth Land and the proposed works would not impact these areas.
Commonwealth Heritage Places	None.
Listed Marine Species	42 identified. Given the small proposed disturbance footprint of the proposal, the nature of the proposed activity, and the distance from the marine environment, marine species are unlikely to be impacted upon.
Whales and Other Cetaceans	None.
Critical Habitats	None.
Commonwealth Reserves Terrestrial	None.
Australian Marine Parks	None.
Habitat Critical to the Survival of Marine Turtles	None.
State and Territory Reserves	Four identified: • Hattons Bluff Nature Reserve, NSW • Mount Jerusalem National Park, NSW • Mount Nullum Nature Reserve, NSW • Wollumbin National Park, NSW The subject site is sufficiently removed from the listed state and territory reserves and therefore the proposed works will not impact upon them.
Regional Forest Agreements	One identified. North East NSW RFA applies over the broader study area; however, none of the reserves included in the RFA occur within the study area.
Nationally Important Wetlands	None.

EPBC Act Referrals	Four identified. The referrals listed have all completed or post-approval assessment statuses or are unrelated to the proposed disturbance footprint and proposal.
Key Ecological Features (Marine)	None.
Biologically Important Areas	None.
Bioregional Assessments	One identified. • Clarence-Moreton bioregion The proposed works are unrelated to coal seam gas and coal mining development.
Geological and Bioregional Assessments	None.

Based on the assessment provided in Table B1 and B2 above, matters protected under the EPBC Act are unlikely to be significantly impacted upon by the proposal and the proposal does not require referral to the Commonwealth Minister of the Environment.

Appendix C Preliminary Flora and Fauna Assessment

TWEED SHIRE COUNCIL

Preliminary Flora and Fauna Assessment

Tweed River flood restoration works, Dum Dum and Uki

June 2023

Table of contents

Introduction

The flora and fauna assessment included a review of the project brief, survey plans, and environmental planning legislation to consider the likely impacts of the proposed activity on native flora and fauna.

Reviews of Tweed Shire Council Weave GIS information including relevant environmental layers were carried out along with searches of State and Commonwealth ecological databases, followed by site visits to assess the potential impacts of the development.

For the purposes of this assessment, the following terms of reference are used:

- Disturbance footprint – refers to the direct footprint subject to development, including any disturbance associated with ancillary works (e.g. temporary access tracks or stockpile sites).
- Study area – the study area includes the disturbance footprint and any additional lands approximately 50 m either side of the disturbance footprint that could be affected directly or indirectly from the proposal. The objective of the assessment would ensure that impacts beyond the direct disturbance footprint are also considered where relevant.
- Subject site – refers to the parcel/s of land on which the development is proposed.
- Broader study area – lands within 10 km of the local study area and includes the BioNet Atlas of NSW Wildlife and Commonwealth Protected Matters database search areas.
- Bioregion – as classified by the Interim Biogeographic Regionalisation for Australia (IBRA) v 6 mapping (Thackway and Cresswell 1995). A bioregion is an area of common climate, geology, landform, native vegetation and species information. This project is located within the South East Queensland bioregion and Burringbar-Conondale sub-region.

Direct and indirect impacts are defined in accordance with Office of Environment and Heritage (OEH) (2018) as follows:

- Direct impacts are those that directly affect the habitat of species and ecological communities and of individuals using the study area. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat.
- Indirect impacts occur when project-related activities affect species or ecological communities in a manner other than direct loss within the subject site. Indirect impacts may sterilise or reduce the habitability of adjacent or connected habitats. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, reduction in viability of adjacent habitat due to edge effects, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, noise, light spill, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas.

Assessment aims

The principal aim of the assessment was to determine the potential impact of the proposed activity on significant flora, fauna and ecological communities using the following legislation and planning and management policies:

- NSW *Environmental Planning and Assessment Act 1979* (EP&A Act)
- NSW *Biodiversity Conservation Act 2016* (BC Act)
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Fisheries Management Act 1994* (FM Act)
- Tweed Coast Comprehensive Koala Plan of Management
- Threatened species recovery plans.

Specifically, the aims of the study were to:

- identify vegetation communities, flora and fauna species, and habitats within the study area
- undertake field and desktop assessments to identify the likelihood of conservation significant species and communities occurring within the study area
- assess the conservation status of the site
- identify impacts associated with the proposal pursuant to section 7.3 of the BC Act, if required
- determine whether there is a need to conduct a Species Impact Statement or make a referral to the Commonwealth Department of Agriculture, Water and the Environment (DAWE)
- provide recommendations to minimise impacts on conservation significant species and biodiversity generally.

Desktop assessment methodology

The desktop assessment involved a review of the following information:

- BioNet Atlas of NSW Wildlife database to identify any known records of significant flora and fauna species
- DAWE EPBC Act Protected Matters online database to identify any Matters of National Environmental Significance
- NSW EES and Department of Primary Industries registers of critical habitat (also referred to as Areas of Outstanding Biodiversity Value under the BC Act)
- NSW EES regional and subregional fauna corridor and key habitat mapping
- NSW and Commonwealth lists of Key Threatening Processes
- NSW EES threatened species website for existing Recovery Plans and Threat Abatement Plans
- Atlas of Living Australia wildlife records
- Tweed Coast Comprehensive Koala Plan of Management (TSC, 2014)
- Koala habitat mapping (TSC Weave GIS)
- Tweed Shire Council vegetation mapping (OEH 2012) to identify the potential presence of any Endangered Ecological Community (EEC) or Threatened Ecological Communities (TECs) listed under the BC Act or EPBC Act, respectively
- Tweed Shire Roadside Vegetation Management Plan (Tweed RVMP) (Bushland Restoration Services Pty Ltd & Landmark Ecological Services Pty Ltd, 2013)

- Tweed Shire Council GIS layers such as the contour mapping, slope and soils
- Past fauna survey and assessment reports for the area.

Database searches were undertaken using a 10 km radius of the subject site.

Desktop assessment results

The results of the desktop assessment are summarised in Table C1 as follows:

Table C1: Desktop assessment results

Attributes	Comments
Vegetation communities	The Tweed Shire Council vegetation mapping identifies 3 vegetation communities as occurring within the disturbance footprint: • Camphor laurel dominant closed to open forest (veg code: 1004) • Open Water (veg code: 903) • Substantially cleared of native vegetation (veg code: 1099). **Camphor laurel dominant closed to open forest** Kingston et al (2004) describes the camphor laurel dominant closed to open forest vegetation community as being dominated by camphor laurel (*Cinnamomum camphora*) and often occurs as pure, even-aged stands or where disturbance has been extensive in other vegetation types some emergent or remnants of this type may remain. Other species, such as brush box (*Lophostemon confertus*), may occur within this type having established at the same time as the camphor. This type occurs on more fertile soils especially those of volcanic origin and in areas of high soil moisture, typically colonising areas that may have previously supported rainforest or wet sclerophyll forest that had been cleared for agriculture. **Open water** The open water community is mapped as expanses of open water both fresh and saline and with or without floating vegetation or vegetated edges. **Substantially cleared of native vegetation** The substantially cleared of native vegetation community is described as forming approximately half of the area of the Shire which includes areas cleared for agriculture, recreation facilities, roads and urban development. Vegetated areas occurring in this community type are generally dominated by exotic grass species. If native vegetation is present it is very sparse and highly disturbed. Other vegetation communities within the study area include: • early regrowth rainforest (veg code: 1002) **Early regrowth rainforest** This community is described as occurring with a mixture of early stage rainforest regeneration and some sclerophyll species often on soils of high fertility where rainforest or wet sclerophyll open forest to woodland types may have previously occurred. Refer to Figure C1 below.

Attributes	Comments
Threatened ecological communities	None of the vegetation communities identified above are analogous with any threatened ecological communities listed under the BC Act or EPBC Act.
Threatened flora records	A search of threatened flora species on the BioNet Atlas of NSW Wildlife and Commonwealth Matters of National Significance databases was undertaken based on a 10 km buffer of the subject site. A total of 61 threatened flora species were short-listed from these searches. Of these 61 short-listed threatened flora species, a likelihood of occurrence assessment concluded none were likely to occur within the study area due to the disturbance within the subject site.
Corridor mapping	The southern end of the subject site is mapped as being within a regional corridor which extends in an east-west direction connecting areas of core habitat, namely Wollumbin National Park and Mount Nullum National Park before connecting to other north and south areas of core habitat including Mount Jerusalem National Park.
Osprey nests	[redacted]
Flying-fox camp	[redacted]
Marine vegetation	The Tweed River in this location is freshwater and therefore no marine vegetation occurs within the study area.
Koala habitat	Small, isolated patches of koala habitat are mapped throughout the broader study area in the Dum Dum, Uki and Mount Warning localities. The closest patches being associated with the tallowwood open forest vegetation community west of the Tweed River on a ridgeline (~150 m west of the disturbance footprint). The most recent koala records in the broader study area are from 2016.
Threatened fauna	A search of threatened fauna species on the BioNet Atlas of NSW Wildlife and Commonwealth Matters of National Significance databases was undertaken based on a 10 km buffer of the subject site. A total of 88 threatened fauna species and 3 populations were short-listed from these searches (marine and pelagic species were immediately dismissed on account of the absence of such habitat in the study area). Of these 88 short-listed threatened fauna species, 8 species were considered likely to occur in the study area including: [redacted]

Attributes	Comments
	[redacted]

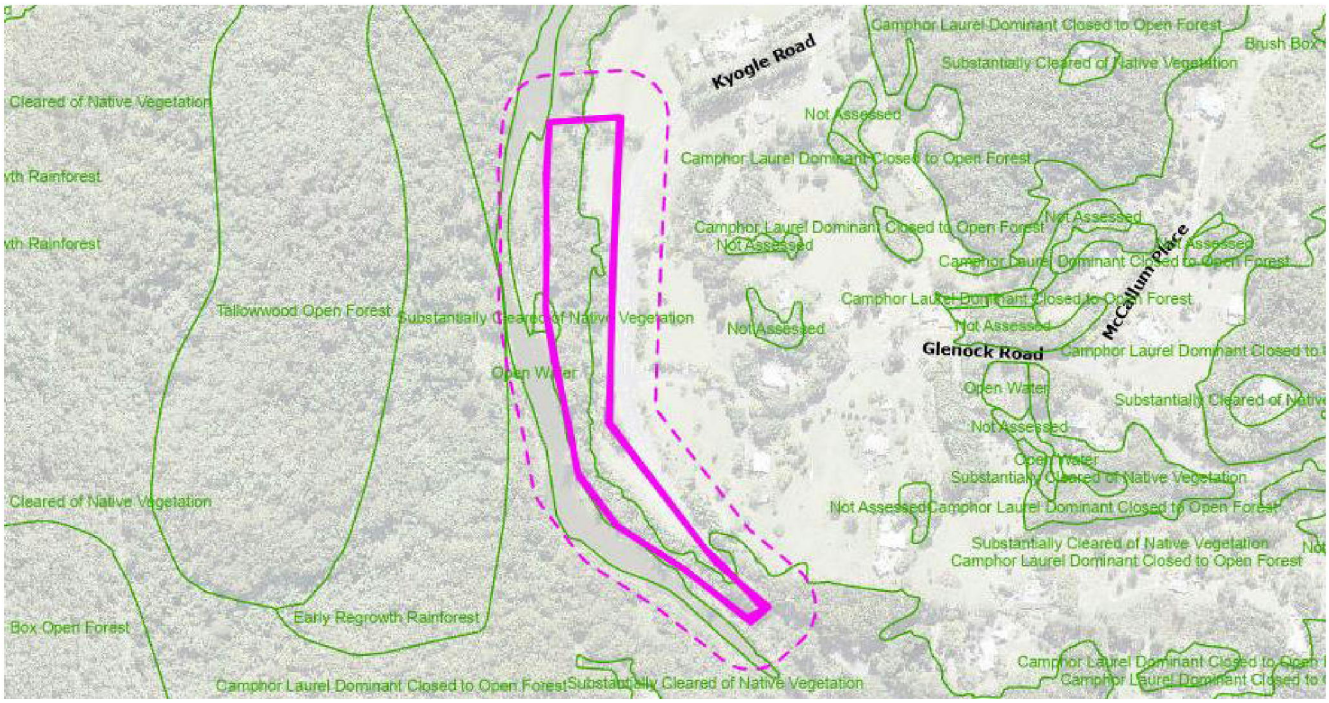


Figure C1: Tweed Shire Council vegetation mapping, proposed disturbance footprint alignment in pink (50 m study area = dashed pink polygon).

Field assessment methodology

A preliminary diurnal field assessment was undertaken on 10 November 2022 and 4 March 2023. The field assessment involved traverses over the disturbance footprint to validate the results of the desktop study and assess the potential impacts of the development in the study area. In summary, this involved carrying out searches for the following:

- Characterisation of vegetation communities within the development footprint.
- Identification of retained vegetation which may be impacted upon by root damage from construction works.
- Potential fauna habitat likely to be affected by the proposal such as burrows, hollow-bearing trees, flowering trees, nests, and other general signs of fauna activity such scats, tracks, and traces.
- The impact of disturbance on fauna movement and bushland linkages.
- Potential sources of erosion and sediment loss.
- Receiving waterways and the potential impacts on these aquatic habitats.

Field assessment results

Flora

The site assessment confirmed that vegetation within the study area is generally consistent with that mapped by Kingston et al (2004), being substantially cleared of vegetation with camphor laurel dominant open forest and open water communities. The central and southern areas of the subject site have mostly been stripped bare of vegetation caused by flooding in 2022 and the only vegetation regenerating is predominantly exotic invasive species including giant devils fig (*Solanum chrysotrichum*), fleabanes (*Erigeron spp.*), South African pigeon grass (*Setaria sphacelata*) and native smartweeds (*Persicaria spp.*) and sedges (see Plates C1–C3). Some mature exotic camphor laurels (*Cinnamomum camphora*) survived the floods and are present in the central and northern areas of the subject site.

The vegetation present in the northern end of the subject site has regrowth of varying stages of maturity and had also received revegetation in previous years. This vegetation is a mix complex of tree and shrub species, with dominant species including mature, exotic camphor laurels, native blue figs (*Elaeocarpus grandis*), Macaranga (*Macaranga tanarius*) and river oaks (*Casuarina cunninghamiana subsp. cunninghamiana*). This area was mapped by OEH (2012) as camphor laurel dominant open forest and Kingston et al (2004) described this community as having co-dominant species of river oak and macaranga. Field surveys were consistent with this mapping and vegetation description. Canopy cover in vegetated areas where canopy species were present was approximately 60-70%, however this ranges over the years due to levels of disturbance caused by flooding and then the subsequent regeneration of vegetation. Ground cover in this area of the subject site is predominantly exotic grass and herbaceous species. The exotic cat's claw creeper (*Dolichandra unguis-cati*) was also present.

Of the 61 short-listed threatened flora species, a likelihood of occurrence assessment concluded none were likely to occur within the study area due to the historical land use and associated vegetation clearing and the ongoing disturbance of flood events. No threatened flora species were identified during field surveys.

Overall, the vegetation within the disturbance footprint is reflective of the historic clearing and land use and flood events that have occurred. No vegetation communities present within the study area are considered to be consistent with any TECs listed under the NSW BC Act or the EPBC Act.

Plate C1: Southern end of subject site looking south

Plat C2: Southern end of subject site looking north

Plate C3: Northern end of subject site looking south

Fauna

Fauna habitat within the disturbance footprint was found to be limited on account of the area being highly disturbed. However, in the broader context, the Tweed River and associated ecosystems in the broader study area offers a diverse mosaic of vegetation communities including tallowwood open forest, early regrowth rainforest, lowland rainforest on floodplain and the aquatic environment. [redacted]

An assessment of specific habitat attributes within the study area is provided in Table C2 below.

Table C2: Fauna habitat attributes associated with the subject site

Fauna habitat attributes	Comments
Rock features including cracks, sheets, shelters, outcrops	Rock outcrops were observed on the western bank of the Tweed River within the study area.
Autumn - winter - early spring flowering eucalypts	None observed within the study area. Present within the broader study area.
Summer flowering eucalypts	None observed within the study area. Present within the broader study area.
Acacia shrubs-trees	*Acacia spp*. are present within the broader study area.
Other flowering and fruiting resources	Present within the study area are native species such as blue fig, macaranga, river oak, and other species associated with riparian ecosystems. Camphor laurels although are and exotic species are

Fauna habitat attributes	Comments
	prevalent in the region and provide an alternative fruiting and flowering resource.
Allocasuarina spp. and *Casuarina* spp. resources for Glossy Black Cockatoos	River ok (*Casuarina cunninghamiana subsp. cunninghamiana*) was present within the study area in which Glossy Black Cockatoos are very rarely known to feed on this species. *Allocasuarina spp.* are likely to occur in the broader study area.
Koala feed trees	None observed within the study area. Present within the broader study area.
Open grassy patches	Cleared mowed grassland is present within the study area (e.g. the maintained public parkland of Riverside Park and residential yards). Given the intensive maintenance regime for these areas, they provide limited habitat value in terms of shelter or nesting habitat, even for open land species.
Cracks, crevices, and other roosting sites (man-made or otherwise) for insectivorous bats	The nearby residential houses provide potential micro-bat roosting habitat in the form of roof cavities. The mature trees in habitats within the broader study area may provide some roost potential by the way of bark and hollows.
Ephemeral water bodies	None observed within the study area.
Permanent water bodies	The Tweed River occurs within the subject site.
Drainage lines and/or soaks and/or man-made water bodies	None observed within the study area.
Understorey cover for ground dwelling mammals	Some shrubs and groundcover vegetation within the vegetated northern section of the subject site offered cover to ground dwelling mammals such as rodents. However, this resource was generally scarce within the study area.
Fallen fine and coarse vegetative litter	Some leaf litter is provided within the vegetated northern section of the subject site. However, this resource was generally scarce within the study area on account of the regular mowing regime the park is subjected to and the lack of vegetation throughout the remainder of the site.
Hollows in live and dead trees	None observed within the study area.
Marine Vegetation	None observed within the study area. Occurs in downstream tidal reaches of the Tweed River.
Riparian vegetation	Observed within the study area and in the broader sense upstream and downstream of the Tweed River. Occurs as predominantly camphor laurel dominant open forest with some native species within the forest complex.
Flying-fox camps	The nearest flying-fox colonies are located approximately 2.2 km south of the subject site at Uki.

Fauna habitat attributes	Comments
Osprey and/or other raptor nests	[redacted]
Exposed coastal fore dunes and beaches	None present within the broader study area.
Oceanic habitats	None present within the broader study area.
Areas of Outstanding Biodiversity Value pursuant to NSW legislation	None present within the study area. [redacted]

Impact assessment

Flora

The proposed Tweed River flood restoration works has been designed to avoid the need to clear existing trees and to minimise disturbance of existing tree roots. Mature native vegetation would be retained and protected. Tree protection measures during construction are required to ensure compaction to TPZs caused by machinery is avoided or minimised and accidental damage to trunks and limbs does not occur. Threatened flora species were not recorded during field surveys and therefore impacts are not considered likely.

Additionally, revegetation of the banks would occur as part of the proposed restoration works to assist with the stabilisation of the bed and banks of the Tweed River, to improve the overall ecosystem and waterway health of the catchment and to assist in stabilising the retained mature vegetation.

Fauna

As previously discussed, the habitat values within the broader study area are significant due to the diverse mosaic of ecological communities and the aquatic habitat present. However, the habitat values within the disturbance footprint itself are limited on account of the absence of native vegetation communities, the disturbance to grassed areas (mowing regime) and the disturbance of erosion and land loss caused by flood events. The proposed works would stabilise the bed and banks of the Tweed River in this localised area by using pile fields, pile groynes, rock revetment, rock girdles, A-frame deflectors which would all provide habitat for land and aquatic fauna species. These methodologies would also provide for soil accretion opportunities whereby revegetation undertaken as part of these proposed works would colonise and create habitat in the long term.

As previously stated, the likelihood of occurrence (LOC) assessment concluded that [redacted]

All of these species are highly mobile and their interactions with the ecological resources within the study area are expected to be limited to flyovers or occasional foraging.

None of these species are expected to rely on any of the trees, shrubs or grassed area habitat within the disturbance footprint for breeding.

It is expected that the proposed works would proceed without any significant direct or indirect impact upon fauna species breeding or foraging habitat. Given the disturbed nature of the subject site, the limited habitat features, and the short-term disturbance proposed, none of the species considered likely to occur within the study area are expected to rely upon the habitat contained within the footprint of direct disturbance. Accordingly, it is anticipated that there would be no impact upon threatened fauna as a result of the proposed activity.

Requirement for Part 7 (BC Act) Assessments

Section 7.8 of the *Biodiversity Conservation Act 2016* (BC Act) outlines the biodiversity assessment requirements for Part 5 activities under the EP&A Act and notes a Part 5 activity is to

be regarded as having a significant effect on the environment if it is likely to significantly affect a threatened species. Section 7.3 of the BC Act outlines the test for determining whether an activity is likely to result in a significant impact on threatened species or ecological communities (test of significance).

The Threatened Species Test of Significance Guidelines – The Assessment of Significance (OEH, 2018) explain that a species does not have to be considered as part of the assessment of significance if adequate surveys or studies have been carried out that clearly show that the species:

- does not occur in the study area
- will not use on-site habitats on occasion
- will not be influenced by off-site impacts of the proposal.

Otherwise all species likely to occur in the study area (based on general species distribution information), and known to use that type of habitat, should be considered in the rationale that determines the list of threatened species, populations and ecological communities for the assessment of significance (OEH, 2018).

With the above in mind, species considered to warrant further consideration pursuant to Section 7 of the BC Act are those that have a high likelihood of occurrence within and adjacent the study area and could be either directly or indirectly impacted by the proposal. That is, these species are considered likely to interact with those habitats directly and or indirectly impacted by the development proposed. For example, species with specific lifecycle requirements such as hollow dependent species that may be impacted through loss of hollow bearing trees would be included within the Section 7.3 assessment. In contrast, those species which have broad home ranges and do not have specific habitat elements within the study area, may not be considered further.

Based on the discussion provided above, further consideration by way of test of significance pursuant to Part 7 of the BC Act was not considered warranted for any of the short-listed species. This conclusion is based on the limited scale and extent of the disturbance footprint relative to the home ranges of each of the species and the limited interaction anticipated between the short-listed species and the habitat features provided within the study area. The habitat provided within the disturbance footprint is not considered to constitute critical habitat for the species and the proposed temporary disturbance is unlikely to place any species at risk of extinction.

Flora and fauna assessment conclusion

In summary, this preliminary flora and fauna assessment suggests that the conservation values of the disturbance footprint are low given the extent of existing disturbance and lack of native vegetation communities. [redacted]

The assessment has determined that the proposed activity is unlikely to result in a significant impact upon threatened species, populations or communities and that the activity does not require referral to the Commonwealth DAWE for assessment under the EPBC Act.

Environmental safeguards to mitigate impacts on the receiving environment are proposed within Section 8 of the REF.

Contact and connect

02 6670 2400

tweed.nsw.gov.au
tsc@tweed.nsw.gov.au
PO Box 819 Murwillumbah NSW 2486

Appendix D Preliminary Aboriginal Cultural Heritage Assessment

TWEED SHIRE COUNCIL

Preliminary Aboriginal Cultural Heritage Assessment (PACHA)

Tweed River flood restoration works, Dum Dum and Uki

June 2023

Version control

Version	Title	Date
1.0	Preliminary Aboriginal Cultural Heritage Assessment (PACHA)	27/6/2023

Table of contents

Definitions

AAC:	**Aboriginal Advisory Committee**
ACH:	**Aboriginal cultural heritage**
ACHA:	**Aboriginal Cultural Heritage Assessment**
ACHAR:	**Aboriginal Cultural Heritage Assessment Report**
ACHMP:	**Tweed Shire Aboriginal Cultural Heritage Management Plan 2017**
AHIP:	**Aboriginal Heritage Impact Permit** The statutory instrument that OEH issues under section 90 of the NPW Act to manage harm or potential harm to Aboriginal objects and places.
AHIMS:	**Aboriginal Heritage Management Information System** AHIMS is a part of OEH and maintain the NSW records database of Aboriginal objects/sites, declared Aboriginal Places and archaeological reports submitted either voluntarily or as part of compliance-related submissions.
Disturbed land:	Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable. Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks. Refer also to Clause 58 of the NPW Reg.
Due Diligence code:	Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECC&W, 2010)
EIS:	**Environmental Impact Statement**
PACHA:	**Preliminary Aboriginal Cultural Heritage Assessment** Process to assess whether Aboriginal objects will or are likely to be harmed, and whether further investigation and impact assessment is required. Determines whether an ACHA is required and, subsequently, whether an AHIP is required.
DPE:	**Department of Planning and Environment, NSW Government**
EP&A Act:	**Environmental Planning and Assessment Act, 1979**
NPW Act:	**National Parks and Wildlife Act, 1974**
NPW Reg:	**National Parks and Wildlife Regulation, 2019**
OEH:	**Office of Environment and Heritage, NSW Government**
Study area:	For the purpose of this PACHA, the study area is the spatial extent in which the proposed works could potentially directly and indirectly impacts on the ACH values of the site. For this particular assessment, the study area is defined as the lands and waters within 200 m of the subject site.
TBLALC:	**Tweed Byron Local Aboriginal Land Council**
TSC:	**Tweed Shire Council**

1.0 Introduction

The aim of this Preliminary Aboriginal Cultural Heritage Assessment (PACHA) is to ensure Council infrastructure projects minimise the risk of harm to Aboriginal places and objects of cultural heritage significance.

The objective is to identify those projects with a significant risk of harm to Aboriginal cultural heritage (ACH) and those projects for which the risk is low.

Those projects determined to have a high risk of harm to ACH require a more detailed assessment in the form of an Aboriginal Cultural Heritage Assessment Report (ACHAR) and potentially an Aboriginal Heritage Impact Permit (AHIP).

Those determined to have a low risk of harm to ACH may proceed with caution without an ACHAR or AHIP.

The PACHA is suitable for incorporation into Tweed Shire Council (TSC) environmental planning assessments for works deemed:

- permissible with consent
- permissible without consent
- exempt activities under the EP&A Act, with the exception of projects requiring an Environmental Impact Statement (EIS) for which the assessment requirements are directed by the Secretary's Environmental Assessment Requirements (SEARs).

2.0 Planning considerations under the NPW Act/Reg

The following clauses were considered to determine whether any of the exemptions or defences identified under the NPW Act/Reg apply.

Planning consideration	Response
Are the works exempt under s87A of the NPW Act (e.g. specified emergency or conservation activities)	☐ Yes ☒ No
Are the works exempt under s87B of the NPW Act (e.g. traditional Aboriginal cultural activities)	☐ Yes ☒ No
Is the activity a low impact one for which there is a defence under Clause 58 of the NPW Reg? (e.g. maintenance of existing infrastructure on disturbed land; 'disturbed land' is defined in the definitions section) **N.B.** If yes, there is still a responsibility to not harm or desecrate an object that a person knows is an Aboriginal object; stop works procedures still apply to any unexpected finds.	☐ Yes ☒ No

3.0 Scope of work

The following questions were addressed to clarify the type and scale of works proposed.

Scope/scale of works	Response
Is the work trivial or negligible? (e.g. picking up and replacing a small stone artefact, breaking a small Aboriginal object below the surface when you are gardening, crushing a small Aboriginal object when you walk on or off a track, picnicking, camping or other similar recreational activities)	☐ Yes ☒ No
Will the works involve ground disturbance?	☒ Yes ☐ No
What is the scale of excavation works? (refer to ACHMP page 105 for definitions of minimal, moderate and major)	☐ Minimal ☐ Moderate ☒ Major
Will the works impact upon any known or suspected culturally modified trees? (e.g. scar trees)	[redacted]

4.0 Assessment methodology

The following desktop and site assessments were performed and used to determine the level of community consultation required, if any.

Assessment type	Response
Desktop assessment	☒ Review ACHMP mapping GIS layer ☒ Search AHIMS database Review site cards relevant to the study area: ☐ Y ☒ N/A ☒ Search NSW Heritage database for Aboriginal Places ☒ Review topographic GIS layers (e.g. contours) Review previous ACHARs relevant to the study area: ☐ Y ☒ N/A
Site assessment	☒ Walkover by TSC Environmental Scientist

5.0 Desktop results

The results of the desktop assessment are detailed below.

Desktop resource reviewed	Response
Does an Aboriginal Place (as declared under the NPW Act) apply to the study area?	[redacted]
What ACHMP mapping designations apply to the study area? (refer to TSC GIS layer under Planning Strategies and Policies)	
Are there any registered AHIMS site records identified within the study area?	[redacted]
What ACH values apply or potentially apply to the study area? (refer to site cards, previous ACHARs and ACHMP mapping attribute data)	[redacted]
Do any of the following landscape features apply to the study area?	☐ Ridgelines ☐ Coastal headland ☐ Sand dunes ☐ Rock shelters (within 20 m) ☒ Waterways (within 200 m) ☐ Other (specify) _____
Are the works proposed on disturbed land? ('disturbed land' is defined in the definitions section)	☒ Yes ☐ No

Desktop resource reviewed	Response
Is the site in proximity to the Holocene high stand shore line? (refer to contours and AHD 1.5 m for indication)	☐ Yes ☒ No

6.0 Site inspection findings

The results of the site inspection are detailed below.

Site inspection conditions/findings	Response
How was the ground surface visibility?	☐ Good ☒ Moderate ☐ Poor
Were any Aboriginal objects/values identified during the site assessment?	[redacted]
Were any potential ACH objects/values identified/recorded during the site visit? (e.g. artefacts, scar trees, midden material, burials, grinding grooves, charcoal deposits) Note: attach photos to plates section where appropriate – seek permission from the TBLALC for potentially sensitive matters.	[redacted]
What evidence of previous ground disturbance was observed within the proposed works area?	☒ Built road ☐ Fence construction ☐ Imported fill ☐ Construction of buildings/structures ☐ Construction/installation of utilities ☒ Earthworks/reformed land ☒ Other (please specify) Historical tree clearing for agricultural activities; major floods in 2017 and 2022 caused land loss, erosion and loss of trees.

7.0 Consultation outcomes

The desktop assessments and site inspections which indicate potential for harm, or a high degree of uncertainty regarding potential for harm, to ACH are required to seek further information and expertise through consultation with community members/cultural heritage experts.

Consultation outcomes	Response
Do the results of the desktop assessment and site inspection indicate potential for harm, or a high degree of uncertainty regarding potential for harm?	[redacted]
Stakeholders consulted	[redacted]
Did any stakeholders request additional site inspections?	☐ Yes ☐ No ☒ N/A
Did representatives request to have site monitors present during construction?	☐ Yes ☐ No ☒ N/A
Did representatives recommend an Archaeologist inspect the site?	☐ Yes ☐ No ☒ N/A
Did representatives recommend an ACHAR be prepared and an AHIP be applied for?	☐ Yes ☐ No ☒ N/A
Did representatives request any project-specific mitigation measures?	☐ Yes (list recommendations) _____ _____ _____ _____ _____ ☐ No ☒ N/A

8.0 Recommendations and conclusion

Recommendations and conclusion	Response
Does a desktop and site assessment confirm that there are Aboriginal objects or that they are likely?	[redacted]
Does consultation confirm that there are Aboriginal objects or that they are likely?	
Can harm to Aboriginal places and objects be avoided?	
Are site monitors required during construction?	
Is an ACHAR and AHIP required?	

9.0 Figures and plates

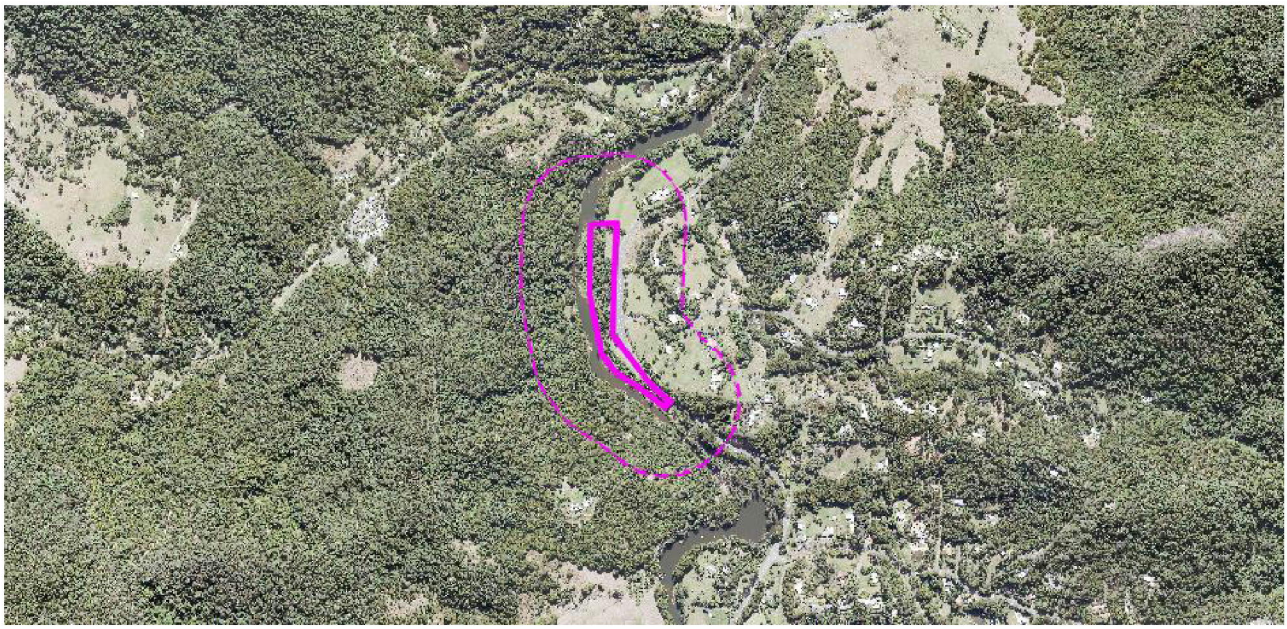


Figure 1: Aerial photograph showing study area (solid pink polygon = subject site; dashed pink polygon = 200 m study area)

[redacted]

Figure 2: ACHMP mapping within the study area (blue polygon represent predictive ACH sites; yellow polygons represent known ACH sites)

Appendix A – ACHMP Stop works procedure

7. Stop Work Procedure

It is an offence to harm an Aboriginal object or place under the NPW Act. Immediate Stop Work procedures are to be implemented when an activity or works reveal any Aboriginal object or remains so as to avoid harm (see definition of harm in Section 7). The following outlines the Stop Work Procedures:

Inadvertent discovery of an object

On discovery of any surface or buried sub-surface cultural material (other than human remains, which is addressed following) the following actions should occur as soon as practicable:

- All work should cease at the location and if necessary, an appropriately qualified Aboriginal sites officer or experienced archaeologist, with expertise in Aboriginal cultural heritage is to be notified, if not already present at the location. The area is to be made safe and cordoned off to prevent access and to protect the object. Construction workers and operational personnel will comply with the instructions of the qualified Aboriginal Sites Officer and/or experienced cultural professional (archaeologist).
- The TBLALC and OEH North East Region Planning Unit are to be notified.
- An Aboriginal cultural heritage assessment of the object and surrounding locality is to be undertaken. A written report of the archaeologist's findings and recommendations is to be provided to registered Aboriginal parties and the OEH for their consideration.
- No further works or development may be undertaken at the location until the required investigations have been completed and permits or approvals obtained as required by the NPW Act and receipt of written authorisation by the OEH North East Region Planning Unit. Upon further advice, construction may be able to continue at an agreed distance away from the site.
- Aboriginal cultural heritage objects are to be registered to the AHIMS.

Inadvertent discovery of a burial or human remains

Burials or human remains are controlled by the following legislation:

- Coroners Act 2009 (NSW)
- Crimes Act 1900 (NSW) and Federal Crimes Act 1914
- National Parks and Wildlife Act 1974 (NSW) covers Aboriginal human remains
- Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, 2010 by OEH

Should human remains be found during the activity or works, the following procedure should be followed. On discovery of the remains the following actions should occur as soon as practicable:

- All work should cease at the location. The Police must be notified, and all personnel and contractors on site should be advised that it is an offence under the Coroners Act to interfere with the material/remains.
- If necessary, an appropriately qualified Aboriginal or experienced archaeologist, with expertise in Aboriginal cultural heritage is to be notified, if not already present at the location. The area is to be cordoned off to access and to protect the remains. Construction workers and operational personnel will comply with the instructions of the qualified Aboriginal sites officer or archaeologist.
- The TBLALC and the OEH North East Region Planning Unit are to be notified.
- No further works or development may be undertaken until the required investigations have been completed and permits or approvals obtained where required in accordance with the NPW Act. Upon further advice, construction may be able to continue at an agreed distance away from the site.
- Burial remains are to be registered to the AHIMS if found to be Aboriginal cultural remains.

Note: A Stop Work Order or Interim Protection Order may also be directed by the Chief Executive under S91AA of the NPW Act.

Contact and connect

02 6670 2400

tweed.nsw.gov.au
tsc@tweed.nsw.gov.au
PO Box 819 Murwillumbah NSW 2486

Appendix E Waste Management Plan

TWEED SHIRE COUNCIL

Waste Management Plan

Tweed River flood restoration works, Dum Dum and Uki

June 2023

Version control

Version	Title	Date
1.0	Waste Management Plan – Tweed River flood restoration works, Dum Dum and Uki.	27/6/2023

Introduction

The following pre-classification of waste streams to be generated during the construction of the proposed road rehabilitation works and associated stormwater pipe installation are based on the following:

- review of the preliminary site contamination investigation
- communication with Council Design Unit Engineering and Drafting personnel
- waste classification of waste streams in accordance with the NSW Waste Classification Guidelines and relevant current NSW EPA resource recovery exemptions
- review of the Stott's Creek Resource Recovery Centre 2022/2023 commercial fees and charges.

Waste streams and associated disposal options are presented in Table 1 below.

Red imported fire ants (*Solenopsis invicta*) biosecurity

Occasionally Tweed Shire Council (TSC) import soil/waste, equipment and plants to use on projects. Importation of materials and equipment into NSW, from or through Queensland red imported fire ant biosecurity zones, must be accompanied by a certificate. Materials and equipment include: hay, straw bales, turf, agricultural and earth moving equipment, organic mulch including manure, soil and potted plants. Types of certificates required are presented in Table 2 below.

Table 1: Waste streams and associated disposal options

Waste stream	Likely sources within the subject site	Pre-classification	Re-use/disposal options without license	Disposal cost (Stott's waste facility)/tonne
Excavated soil material (imported soil)	Excavated material from trenching works: • is naturally occurring rock and soil • contains at least 98% (by weight) natural material • does not meet the VENM definition	Excavated Natural Material (ENM)	• Re-use within the project • Re-use as ENM in accordance with resource recovery exemption (eg. ENM, 2014) • Dispose to licensed landfill validation testing	$241.00
Excavated soil material (imported soil within road reserve e.g. road base)	Excavated material from trenching works: • being rock, soil, sand, bitumen, reclaimed asphalt pavement, gravel, slag from iron and steel manufacturing, fly and bottom ash, concrete, brick, ceramics and materials that hold a resource recovery order for use in road making activities • that have been excavated during the construction and maintenance of council and RMS public roads and public road infrastructure facilities	Excavated Public Road Material (EPRM)	• Re-use within the project • Re-use as EPRM in accordance with resource recovery exemption (e.g. EPRM, 2014) • Dispose to licensed landfill no validation testing	$241.00

Waste stream	Likely sources within the subject site	Pre-classification	Re-use/disposal options without license	Disposal cost (Stott's waste facility)/tonne
Excavated native soil	Excavated material from trenching works (natural material in situ): • that are not contaminated with manufactured or process residues as a result of industrial, commercial, mining or agricultural • does not contain sulphidic ores or soils	Material is identified as Virgin Excavated Natural Material (VENM)	• Re-use on council land or private property subject to approval • Dispose to licensed landfill	$150.00
General construction waste	Discarded pipe fittings, offcuts, geofabric material, sediment fencing etc	General solid waste (non-putrescible) - Building and demolition waste	• Re-use within the subject site • Re-use on private property (less than 200 tonnes) • Dispose to licensed landfill	$241.00
General rubbish litter	Food scraps, paper, cardboard, plastics etc	General solid waste (putrescible and non-putrescible)	• Dispose	$241.00
Vegetation	Removal of roadside turf or grass, other groundcover vegetation within alignment, and shrubs/limbs of trees	General solid waste (non-putrescible) - garden waste Raw mulch exemption 2016	• Re-use within the project • Re-use within the local road network • Dispose to a licensed landfill as green waste	$107.00 (trunks or stumps under 30 cm)

NB: Disposal costs are current at the time of publication. Disposal costs need to be confirmed at the time of construction.

Note the following conditions applicable to Table 1:

Re-use on private property (soil material and concrete):

- Land holder may require development consent for filling.
- Section 143 forms required to be completed.

Building and demolition waste

Building and demolition waste means unsegregated material (other than material containing asbestos waste or liquid waste) that results from:

- the demolition, erection, construction, refurbishment or alteration of buildings other than
    - chemical works
    - mineral processing works
    - container reconditioning works
    - waste treatment facilities
- the construction, replacement, repair or alteration of infrastructure development such as roads, tunnels, sewage, water, electricity, telecommunications and airports

and includes materials such as:

- bricks, concrete, paper, plastics, glass and metal
- timber, including unsegregated timber, that may contain timber treated with chemicals such as copper chrome arsenate (CCA), high temperature creosote (HTC), pigmented emulsified creosote (PEC) and light organic solvent preservative (LOSP)

but does not include excavated soil (for example, soil excavated to level off a site prior to construction or to enable foundations to be laid or infrastructure to be constructed).

Table 2: Red imported fire ant biosecurity requirements for imported waste

Certificate required	Hay	Turf	Soil	Organic mulch	Potted plants	Agricultural and earth moving equipment
Plant Health Certificate	✓	✓	✓	✓	✓	✓
Plant Health Assurance Certificate					✓	
HACCP Biosecurity Certificate ECCPRIFA03					✓	
HACCP Biosecurity Certificate ECCPRIFA21			✓	✓		

Contact and connect

02 6670 2400

tweed.nsw.gov.au
tsc@tweed.nsw.gov.au
PO Box 819 Murwillumbah NSW 2486

Appendix F Preliminary Noise Assessment & Management Plan

TWEED SHIRE COUNCIL

Preliminary Noise Assessment & Management Plan

Tweed River flood restoration works, Dum Dum and Uki

June 2023

Version control

Version number	Amendments	Date	Prepared by	Reviewed by
1.0	N/A	27/6/2023	Environmental Scientist Unit	Environmental Scientist Unit

Table of contents

Introduction

Tweed Shire Council (TSC) proposes to undertake riverbank restoration along the Tweed River at Dum Dum and Uki following the floods of 2022. The proposed works are required to stabilise the Tweed River banks, reduce further erosion in the future and to improve waterway and ecosystem health. This would be achieved by constructing pile fields, rock revetment and undertaking revegetation.

The proposed works are scheduled to commence construction in July 2023 and are expected to take approximately 10 weeks to complete.

The construction works proposed have the potential to cause short-term impacts on the amenity of surrounding residents resulting from construction noise and vibration.

The proposal does not seek to change the current land use of the subject site therefore following construction, the noise environment of the study area is expected to reflect the current environment. Accordingly, no further assessment of operational noise and vibration has been performed for the proposal.

Assessment aims

The purpose of this preliminary noise and vibration assessment is to consider the likelihood of the proposed development having significant adverse effect on sensitive receivers and structures within the study area. Specifically, the aim of this preliminary noise and vibration assessment is to:

- identify nearby sensitive receivers within the study area
- predict the likely noise and vibration impacts of the proposal on those sensitive receivers
- confirm management measures to mitigate any predicted impacts.

Assessment approach

To achieve the aims of this assessment the following tasks were performed:

- Desktop assessment including review of aerial imagery and previous noise and vibration assessments within the locality
- Adoption of construction noise and vibration criteria for the proposal in accordance with industry guidelines and standards
- Review of construction techniques and methods proposed to implement the project
- Assessment of noise and vibration generating activities and their sources during construction
- Assessment and subsequent adoption of feasible and reasonable noise and vibration management measures for the proposal.

Existing environment

The subject site is situated within a rural area within proximity to a rural landscape zoned residential development. Prominent sources of background noise at the site are identified as including general noise associated with rural residential living (i.e. lawn mowers etc.) and vehicular traffic associated with Kyogle Road and Glenrock Road.

The influence of each of these noise sources would be variable at the site and dependent upon the location within the alignment relative to the source. In addition, Kyogle Road has approximately 2,967 vehicle movements per day (18/9/2003) which would contribute to the overall background noise. Based on past experience of sites situated in similar noise settings, the relative background level (RBL) within the study area is conservatively estimated to be 40dB (A) typical of quiet suburban areas.

A number of sensitive receivers occur within proximity (approximately 100 m) to the proposed alignment and include residential dwellings situated on Glenrock Road and Kyogle Road, east and north of the subject site.

For the purpose of this assessment receptors have been identified which comprise of sensitive receivers whose impacts during construction are likely to be common. A total of 10 properties with their associated residential dwellings are shown in Figure F1 and are the nearest sensitive receivers. Additionally, further residential dwellings located in the eastern areas of Glenrock Rd may also receive impacts.

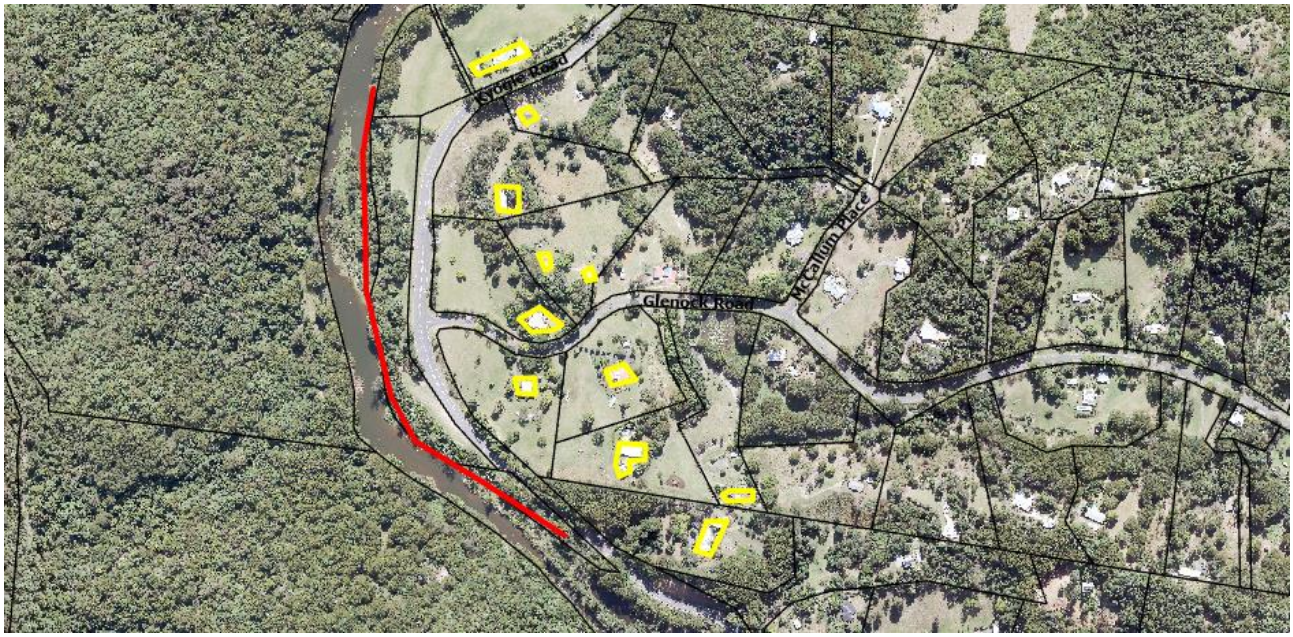


Figure F1: Aerial imagery showing identified receptor groups in proximity to the works alignment.

Construction noise and vibration criteria

Noise management levels

In the absence of locally specific noise management requirements, construction noise in NSW is generally guided through the Draft Construction Noise Guideline (DCNG) (EPA, 2020). The DCNG outlines both qualitative and quantitative noise assessment methods depending on project timeframes. Generally, for short-term local infrastructure projects or minor construction works where work is unlikely to result in significant noise impacts a qualitative noise assessment is appropriate.

For projects typically likely to have high levels of construction noise in proximity to noise sensitive receivers particularly when scheduled outside the recommended standard hours, a quantitative noise assessment is often adapted.

In this instance the proposed project is expected to take 6 weeks to complete, however, given the linear nature of the works, impacts to sensitive receivers along the alignment would be short term only. For this reason a hybrid noise assessment pursuant to the DCNG has been performed for the project.

Table F1 taken from the DCNG identifies the level of noise impact risk factors. It has been determined that the proposed project has a medium risk of noise impact to sensitive receivers.

Table F1: Work attributes and community considerations when selecting the assessment method.

Work attributes and community considerations	Likelihood of noise impact: example of low-risk factors	✓ = risk factor assessment for proposed works	Likelihood of noise impact: example of medium-risk factors		Likelihood of noise impact: example of high-risk factors	
Time of construction	Majority of work during the recommended standard hours	✓	Some work during the evening		A large amount of work during the night-time	
Duration of works	Short duration (e.g. lasting several days) For linear projects, the duration is related to the total time that works is adjacent to sensitive receivers	✓	Medium-duration work (e.g. lasting several weeks) For linear projects, the duration relates to the total time that works is adjacent to sensitive receivers		Lengthy construction periods (e.g. large linear infrastructure projects lasting several months or more) Where work is scheduled during the evening or night, consider the likely impact of the work on sensitive receivers based on its duration and whether the work will be continuous or non-continuous and will affect the same sensitive receivers.	
Noise-making equipment and process	Use of light equipment (e.g. hand-held tools) Infrequent use of hand saws or drills Light vehicles on the worksite Infrequent deliveries and removals		Use of medium-sized equipment (e.g. light to medium excavators, graders and loaders) Use of hand-held jack-hammers and medium-sized drills and cutting machines Light and medium-sized vehicles on the worksite Occasional deliveries and removals by large vehicles		Use of large-sized equipment (e.g. medium to large excavators, graders, dozers, loaders and compactors) Use of rock breakers, piling equipment, power saws, grinders, explosives/blasting and high-pressure equipment Medium- and large-sized vehicles on the worksite Regular deliveries and removals by medium and large vehicles	✓
Proximity to sensitive receivers	Extended distances between the worksite and noise sensitive receivers of approximately 1 km and greater		Reasonable distances between the worksite and noise sensitive receives (e.g. several hundred metres)	✓	Minimal distances between the worksite and noise sensitive receives (e.g. tens of metres)	
Containment of noise	Works within a contained building or remote location from sensitive receivers Many opportunities available to control noise at the source and in the path Natural barriers/topography to screen the source of noise from receivers		Outdoor works partially contained from sensitive receivers Some opportunities to control noise at the source and in the path	✓	Outdoor work with minimal isolation or containment from sensitive receivers Limited opportunities available to control noise at the source and in the path	
Number of people affected	Low numbers of sensitive receivers (e.g. up to 25 residences)	✓	Moderate numbers of sensitive receivers (e.g. 25 to 100 residences)		Large numbers of sensitive receivers (e.g. greater than 100 residences	

Community views	The community and consent authority or regulator consider the work uncontroversial or routine		The community and consent authority or regulator have some concern over certain aspects of the work, for example the need for occasional evening or night-time work and/or particularly noisy activities (e.g. rock breaking or piling)	✓	The community and consent authority or regulator have significant concern over certain aspects of the work, for example the need for regular and ongoing evening or night-time work and/or particularly noisy activities (e.g. rock breaking or piling)	

In establishing appropriate noise criteria for the proposed project, the quantitative noise assessment methodology pursuant to the DCNG has been adopted which recommends the following noise management levels for sensitive receivers (refer to Table F2 below).

Table F2: DCNG noise at residences using quantitative assessment during the recommended standard hours construction noise management levels

Time of day	Management level $L_{Aeq, 15min}$[1, 2]	How to apply
Recommended standard hours Monday to Friday 7 am to 6 pm **Saturday 8 am to 1 pm** **No work on Sundays or public holidays**	Noise affected RBL + 10dB	Where the predicted or measured $L_{Aeq, 15min}$ is greater than the noise affected management level, the proponent shall apply all feasible and reasonable work practices to meet this level. As a matter of good practice, noise should be reduced as far as reasonably practicable. The proponent should notify all potentially impacted residents.
	Highly noise affected 75dB(A)	Where noise is above the highly noise affected management level, all feasible and reasonable mitigation shall be applied as well as engagement with the consent authority or regulator to identify other measures to manage noise impacts. Where appropriate, engagement with the community is encouraged to determine the preferred mitigation approach, such as: • negotiated agreements and/or respite periods to restrict work activity • identification of times when the community is less sensitive to noise, including options for longer periods of construction in exchange for restrictions on construction times.

Notes to Table F2:
[1] The predicted noise levels are determined at the property boundary most exposed to construction noise at a height of 1.5 m above ground level. Where the property is more than 30 m from the affected residence, the location for measuring or predicting noise levels is at the most noise affected point within 20 m of the residence. For multi-level residential buildings, the external points of reference for measurement and/or prediction are the two floors of the building most exposed.
[2]No construction works are proposed outside recommended standard hours. Any proposal to perform construction works outside of the recommended standard hours would be subject to an out of hours noise assessment and consultation with affected receivers.

The management levels identified in Table F2 represents the point which there may be some community reaction to noise.

In light of the above, the RBL at the site has been conservatively estimated to be 40 dB(A) based on past experience of sites situated in similar quiet suburban residential noise environments. Given such the adopted noise management level for nearby sensitive receptors during construction would be 50dB(A), being RBL (40dB(A)) + 10dB.

Where the noise management level is exceeded all feasible and reasonable work practices to minimise noise should be applied and all potentially impacted residents should be informed of the nature of the works, expected noise levels, duration of works and a method of contact.

The highly noise affected level represents the point above which there may be strong community reaction to noise and is set at 75 dB(A). Where noise is above this level, respite periods may be required by restricting the hours when the subject noisy activities can occur. For example, times identified by the community when they are less sensitive to noise (such as mid-morning or mid-afternoon for works near residences) or if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Vibration management levels

Construction vibration levels in NSW are assessed pursuant to Assessing Vibration: A Technical Guideline (DECC, 2006) which are based on guidelines contained in BS 6472–1992, *Evaluation of human exposure to vibration in buildings*. This guide provides vibration criteria suitable for assessing human annoyance in response to vibration levels and describes 3 categories of vibration, being:

- Continuous vibration (e.g. road traffic, continuous activity)
- Impulsive vibration – includes less than 3 distinct vibration events in an assessment period (e.g. occasional dropping of heavy equipment)
- Intermittent vibration – includes interrupted periods of continuous vibration (e.g. drilling) repeated periods of impulsive vibration (e.g. pile driving) or continuous vibration that varies significantly in amplitude.

For the purpose of this assessment, vibration at the site resulting from construction activities has been categorised as intermittent vibration with the relevant criteria presented in Table F3.

Table F3: Acceptable vibration dose values for intermittent vibration ($m/s^{1.75}$)

Location	Assessment period	Preferred limit ($m/s^{1.75}$)	Maximum limit ($m/s^{1.75}$)
Critical areas[1]	Day/night-time	0.10	0.20
Residences	Day-time Night-time	0.20 0.13	0.40 0.26
Offices, schools, educational institutions and places of worship	Day/night-time	0.40	0.80
Workshops	Day/night-time	0.80	1.60

Table F3 notes:
[1]Examples of critical areas include hospital operating theatres and precision laboratories where sensitive operations are occurring.

Construction noise and vibration impacts

Construction noise and vibration sources

The assessment of noise and vibration impacts has been undertaken based on consideration of the key construction activities for the proposal. A literature review was carried out to determine the noise and vibration levels associated with various plant and equipment proposed for use during construction. A summary of this review is provided in Table F4 below.

Table F4: Typical construction plant and equipment sound power and vibration levels

Plant and equipment	Sound power level dB (A)	Vibration level PPV mm/s
Excavator 35 tonne + hydraulic hammer attachment	123	12–30 (at 10m)
Excavator 35 tonne + hydraulic vibration attachment	116	~14.7
Excavator 35 tonne	100	0.6 (at 25 m)
Loaded truck	110	0.7 (at 25 m)

The source of the assumed sound power and vibration levels are as follows:

- Australian Standard 2436-1981: 'Guide to Noise Control on Construction, maintenance and Development Sites'.
- Parsons Brinckerhoff (2008), Banora Point Highway Upgrade: Technical Paper 6—Noise and Vibration Assessment. Prepared on behalf of the NSW Roads and Traffic Authority.
- Roads and Traffic Authority (RTA) (2001) 'Environmental Noise Management Manual'.
- Literature review on different plant

Construction noise impacts

An assessment of the anticipated noise impacts during construction indicate that within the receptor group the proposed works would exceed both the adopted noise management level of 50dB(A) and the highly noise affected level of 75dB(A). Table F5 below provides a summary of the predicted worst-case scenario with regards to noise levels during construction.

It should be noted, however that the predicted noise levels identified in Table F5 are a worst-case scenario for each receptor group based on multiple plant and equipment operating simultaneously. It is highly unlikely, however, that all plant and equipment would be operating at the same time.

The predicted exceedances of noise criteria are a result of the separation distances available between the construction footprint and the adjoining sensitive receivers. Given the linear nature of the development, however the expected exceedances would be short-term only with noise levels exponentially declining as the separation distance between each sensitive receiver and the construction footprint increases. Figure F3 highlights the relationship between the noise levels of various plant and equipment to be used during construction and demonstrates the separation distance required to achieve the adopted noise management level of 50dB(A).

In light of the expected exceedance of predicted construction noise levels, an assessment of all feasible and reasonable mitigation measures and construction work practices would be undertaken and implemented to minimise disturbance.

Table F5: Predicted maximum noise level

Maximum combined sound power level with all plant and equipment operating simultaneously dB(A)*	Minimum separation distance from construction works	Predicted combined maximum sound level at receptor group dB(A)**
○ Excavator 35 tonne + hydraulic hammer attachment ○ Truck ○ Excavator 35 tonne	100 m	113
○ Excavator 35 tonne + hydraulic vibration attachment ○ Truck ○ Excavator 35 tonne	100 m	104.5

Notes to Table F6:

* Pursuant to Table B2 of AS2436

** Pursuant to Table D1 of AS2436

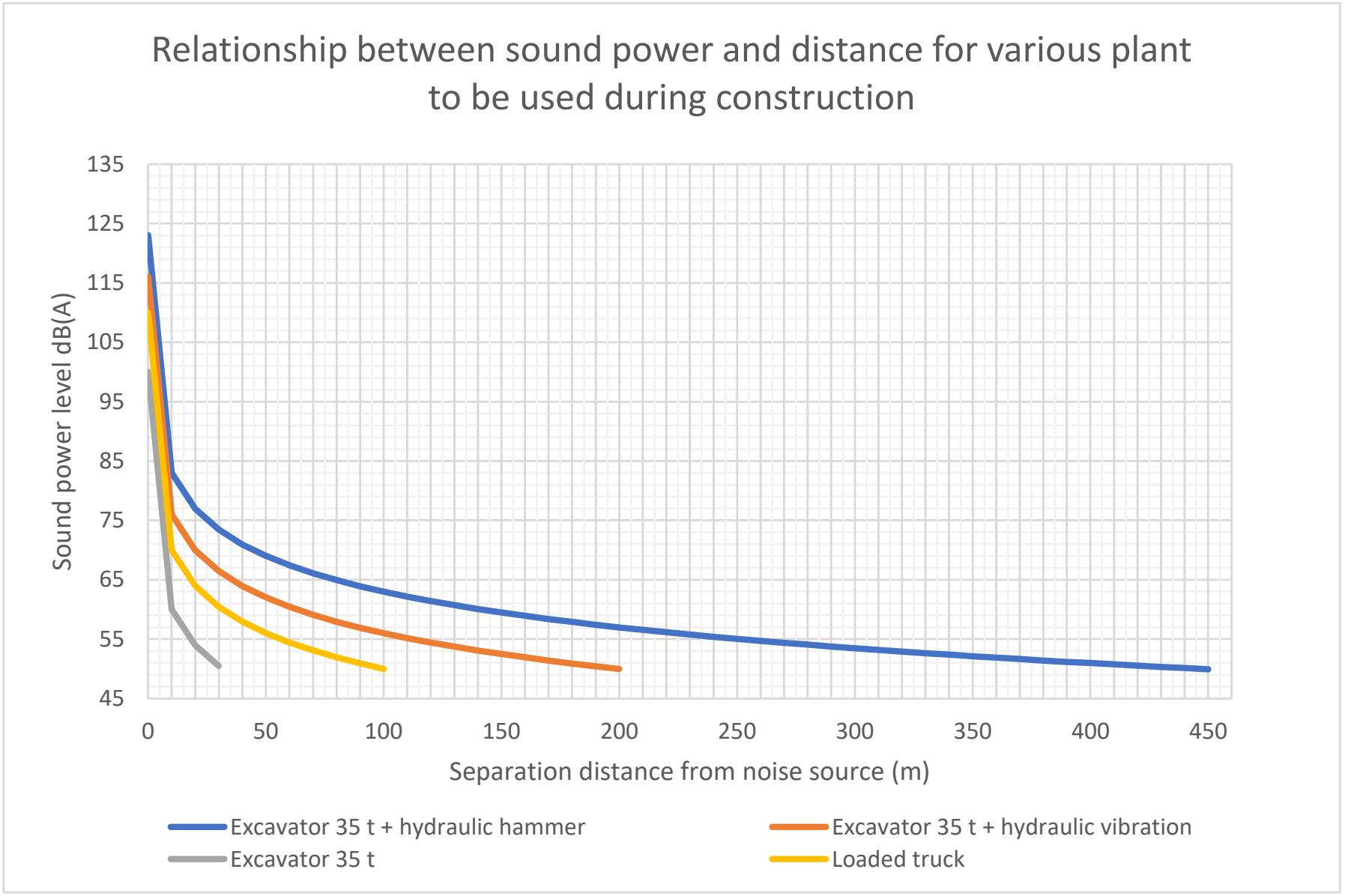


Figure F3: Relationship between sound power and distance for various plant and equipment to be used during construction.

Construction vibration impacts

The operation of construction equipment would cause ground vibrations that spread through the ground and diminish in strength with distance. The proposed development is likely to generate ground vibration impacts which could potentially affect nearby receivers. Impacts resulting from ground vibrations typically include the inconvenience and disturbance of building occupants, disturbance of contents of buildings, and potential impacts to the structural integrity of buildings. During construction potential sources of ground vibration would primarily be associated with the piling works (either hammer or vibratory hydraulic attachment on excavator), excavator movements, trucks dumping rock and logs, and general truck movements associated with construction.

Impacts associated with vibration are dependent on a number of factors including the magnitude of the vibration source, the foundations of structures, and the intensity, duration, frequency and number of vibration occurrences, all of which influence the annoyance levels caused and the strains induced on structures. Vibration levels are measured in units of mm/s with 0.15 being the threshold of perception, 1.0 being noticeable, and 6.0 being strongly noticeable.

Table F4 outlines the typical vibration levels for different plant activities at 10 m and 25 m distances. The plant identified to cause the greatest vibration levels would be from an excavator with the hydraulic hammer or vibration attachment during the piling of the timber piles. As the nearest receptor is at 100 m distance from the site, it is considered that vibration risk is low.

Like noise, the predicted exceedances of vibration criteria are a result of the separation distances available between the construction footprint and the adjoining sensitive receivers. Given the linear nature of the development, the expected exceedances would again be short term only with vibration levels exponentially declining as the separation distance between each sensitive receiver and the construction footprint increases.

In light of the above, community reaction to vibration is considered a possibility during these construction activities. Accordingly, management measures would be required to mitigate any potential adverse amenity and structural impacts.

Noise and vibration management plan

The following is a summary of the standard work practices that would be implemented during construction to manage noise and vibration impacts:

- Construction hours would be limited to 7 am to 6 pm Monday to Friday, 8 am to 1 pm on Saturdays. No works would be undertaken on Sundays or public holidays. Any works proposed outside these times would be subject to an out of hours noise assessment and the further assessment of all feasible and reasonable construction work practices and additional management measures.
- Noise mitigation measures would primarily be limited to minimising noise generated at the source and incorporating management principles into construction works, including:
    - No swearing or unnecessary shouting or loud stereos/radios would occur on site.
    - The dragging of objects, dropping of materials from height, throwing of metal items and slamming of doors would be avoided.
    - Plant operators would be instructed to operate in a manner that does not generate unnecessary noise, such as avoiding excessive revving and minimising compaction where possible. Machines/plant equipment would be turned off when not in use or throttled down to idling.
    - Using excavator bucket or rock claw to move rocks and other solid objects.

    - All plant equipment would be maintained in good condition, with all feasible and reasonable acoustic fittings (i.e. residential mufflers and plant enclosures) installed and maintained (refer to AS 2436 – 1981 'Guide to noise control on construction, maintenance and demolition sites').
    - Quieter and less vibration emitting construction methods would be implemented where possible.
    - Reversing of vehicles would be minimised where possible to alleviate the annoyance of beeping reverse alarms (or less tonal 'broadband' or 'quacker' type alarms would be utilised).
    - Simultaneous operation of noisy plant within discernible range of a sensitive receiver would be avoided.
    - The offset distance between noisy plant and adjacent sensitive receivers would be maximised where possible.
- All employees, contractors and subcontractors are to receive a site induction. The induction must include:
    - all relevant project specific and standard noise and vibration mitigation measures
    - relevant approval conditions
    - standard hours of work
    - any limitations on high noise generating activities
    - location of nearest sensitive receivers
    - construction employee parking areas
    - designated loading/unloading areas and procedures
    - site opening/closing times (including deliveries)
    - environmental incident and complaint management procedures.

Additional management measures

In addition to the above standard work practices, the implementation of additional management measures is proposed during construction to further minimise potential impacts to residents adjoining the alignment. A summary of additional management measures to be implemented during construction include:

- Noise and vibration monitoring
    - As previously discussed, vibration levels during construction are unlikely to exceed the residential annoyance criteria adopted for the project. Complaint based vibration monitoring would be undertaken during construction as required to confirm site specific vibration levels.
    - In addition to the above, complaint based noise monitoring would also be undertaken throughout construction as required to confirm the effectiveness of noise management controls.
- Project specific respite periods would be implemented where possible for high noise activities or on receipt of a complaint deemed reasonable by the Project Manager. The periods could include high noise activities being performed:
    - between 9 am and 4 pm only
    - for no longer than a 3-hour period
    - with a minimum one-hour rest period between any 3 hour period
      or
    - a maximum of 3 days construction
    - one day respite
    - no longer than 3 construction days in a row
- Community consultation program
    - The community consultation program would be overseen by Councils Communications Officer and would include:
        - milestone updates in the Tweed Link and/or social media
        - individual briefings with impacted residents
        - letterbox drops and flyers

        - signage placed around the construction site
        - public on site meeting with impacted residents
    - All of the above correspondence would include:
        - project information and duration
        - phone number/email to contact for project enquiries and complaints.
- Complaints register
    - A complaints register would be maintained by Council's Communication Officer during construction and would include:
        - details of complainant
        - date and time of the complaint
        - nature of the complaint
        - action taken to investigate/rectify the complaint
        - a log of consultation performed with the complainant to resolve the complaint
        - date and time the complaint was closed.

Construction Environmental Management Plan (CEMP)

A CEMP would be prepared prior to the commencement of works and implemented through all phases of the proposed construction works. The CEMP would provide the framework for the management of all potential noise impacts resulting from the construction works and would detail the environmental mitigation measures to be implemented throughout the construction works. The CEMP would incorporate as applicable the measures described above.

Conclusion

The noise and vibration assessment included a hybrid approach to predicting noise and vibration levels during construction in accordance with industry adopted standards and guidelines. The assessment found that identified receptors in proximity to the alignment would be impacted by the proposal with regards to noise.

Given the linear nature of the works, however, the predicted impact at each sensitive receiver would be short term only.

Notwithstanding, a number of standard and additional mitigation measures would be implemented during construction to minimise the potential impacts on adjoining receivers.

Contact and connect

02 6670 2400

tweed.nsw.gov.au
tsc@tweed.nsw.gov.au
PO Box 819 Murwillumbah NSW 2486

Appendix G NSW DPI Fisheries Permit

Department of Primary Industries (Fisheries)
Department of Regional NSW

[redacted]

19 July 2023

The General Manager
Tweed Shire Council
Civic and Cultural Centre, Tumbulgum Rd
MURWILLUMBAH NSW 2484
Via email: gbauld@tweed.nsw.gov.au

Attention: [redacted]

Dear [redacted]

Re: Permit [redacted] for dredging and reclamation work associated with river bed and bank stabilisation works within the Tweed River, Lot 1 DP 608473 & Lot 20 DP 804812, Uki, Tweed Shire Council LGA

I refer to your application dated 26 June 2023 for a permit under Part 7 of the *Fisheries Management Act 1994* (FM Act). DPI Fisheries, a division within the Department of Primary Industries, assesses applications for dredging and reclamation works, harm marine vegetation and obstruction of fish passage in accordance with Part 7 of the FM Act and the *Policy and Guidelines for Fish Habitat Conservation and Management (2013 Update).*

An invoice has been prepared and sent to Council for the statutory minimum initial assessment fee of $358. The quality of the application enabled the assessment to be undertaken without additional charges being required.

Please find enclosed a permit under Part 7 of the FM Act for dredging and reclamation work associated with river bed and bank stabilisation works within the Tweed River, Lot 1 DP 608473 & Lot 20 DP 804812, Uki, Tweed Shire Council LGA.

Please note that the attached permit providing authorisation under the FM Act to undertake dredging and reclamation (s200) does not provide authorisation under any other Act or planning instrument. It is Council's responsibility to ensure they possess all appropriate approvals and land owners consent before works occur. This may include, but is not restricted to, development consent under the *Environmental Planning & Assessment Act 1979* and *Biodiversity Conservation Act 2016* in relation to impacts on terrestrial species and threatened species not covered by the *Fisheries Management Act 1994*; land owners consent and/or licences under the *Crown Land Management Act 2016*; and controlled activity approvals under the *Water Management Act 2000.*

Please carefully read and note the conditions included in the permit. **If you agree that all the conditions are reasonable, appropriate and achievable, you must sign and date the attached sheet (Acceptance of Conditions) and return it to the Contact Officer as soon as possible.** **If you believe that you cannot comply with all the conditions then you must not commence work.** Instead, you should contact the Contact Officer listed on the first page of the permit so that your concerns can be considered.

If you intend to have the work undertaken by a contractor, please ensure that the contractor receives a full copy of the permit and understands the importance of abiding by the conditions. As the permit holder and proponent of the works, Council is responsible for ensuring that all conditions are fully adhered to. **Breaching a condition of a permit can incur an on-the-spot fine of up to $500 or up to $11,000 through the local court pursuant to clause 225 of the *Fisheries Management (General) Regulation 2019*.**

The extent of work is to be restricted to that outlined in the application and plans submitted to DPI Fisheries. **If for any reason, other works are required, or the works need to be extended to other areas, you must seek specific approval beforehand.** DPI Fisheries will require justification for these variations and may charge additional assessment fees as outlined in the permit application. Similarly, **please note the expiry date on the permit.** If the works are not completed by the expiry date you will need to obtain an extension. **Requests to renew a permit before the expiry date will not incur a fee. Requests to renew a permit that has expired within the last 3 months will incur a $179 fee. Permits that have expired more than 3 months previously will need to be reapplied for.**

DPI Fisheries places particular importance upon the need to minimise the harm to the natural environment both at the worksite and downstream waters. We expect implementation of Best Management Practice with respect to erosion and sediment control and aquatic vegetation management. This includes:

- Work scheduling (e.g. installation of protective measures before earthworks commence, suspension of works during rain etc.);
- Deployment of protective measures (e.g. silt curtains, site drainage, separation of "clean" and "dirty" water, silt stop fencing, check dams, sediment traps etc.); and
- Constant maintenance of protective measures (e.g. replacing torn silt-stop fencing, replacing silt-stop fencing which has fallen down or been knocked over, removing accumulated sediment etc.).

Please refer to the publication Landcom (2004), *Managing Urban Stormwater: Soils and Construction* (4th Edition), commonly referred to as "The Blue Book" for guidance (www.environment.nsw.gov.au/research-and-publications/managing-urban-stormwater-soils-and-construction-volume-1-4th-editon).

DPI Fisheries highlight that the State Environmental Planning Policy (Transport and Infrastructure) 2021 requires that exempt developments, complying developments and emergency works are carried out in accordance with all applicable requirements of The Blue Book.

If you have any queries, please contact Fletcher Mingramm, Fisheries Manager Coastal Systems (North Coast) on 0499 689 583 or fletcher.mingramm@dpi.nsw.gov.au.

Yours sincerely

[redacted]

Senior Fisheries Manager, Coastal Systems (North Coast)
Marine Estate Management, Primary Industries NSW
Authorised delegate of the Minister for Agriculture

Cc: fisheries.compliance@dpi.nsw.gov.au

Permit under Part 7 of the

FISHERIES MANAGEMENT ACT 1994

Permit	Permit Number [redacted]	
	Expiry Date	Unless cancelled or suspended sooner, this permit or updated variations shall remain in force until **31 July 2024**
Permit Holder:	The General Manager Tweed Shire Council Civic and Cultural Centre, Tumbulgum Rd MURWILLUMBAH NSW 2484 **Responsible Officer:** [redacted]	
Permit Area:	Dredging and reclamation is permitted within the bed and eastern banks of the Tweed River over an approximately 755m long stretch adjacent to Lot 1 DP 608473 & Lot 20 DP 804812, Uki, Tweed Shire Council LGA. **(Refer to Attachment 1)**	
Permit Activity:	Dredging and reclamation works, specifically: - Excavation and bank battering of approximately 670m^3 of water land in the form of an ~335m x 2m x 1m trench for a rock revetment. - Reclamation of approximately 67,950m^3 comprised of pin row fields and rock revetment. o Pin row fields are to be comprised of hardwood pins driven at least 2m into the bed and interspersed with rock girdles placed perpendicular to the flow and snag hotels constructed for the full length of the river section. o Corrugated rock revetment to total approximately 2010m^3, comprised of 400–700 mm diameter rock and keyed into the bed at a depth of 1m. Associated with the river bed and bank stabilisation works as proposed in your application 26 June 2023. **(Refer to Attachment 2)**	
Departmental Contact Officer:	[redacted] Fisheries Manager, Coastal Systems (North Coast) 1243 Bruxner Hwy WOLLONGBAR NSW 2477 Ph: [redacted]	

This permit is subject to the following conditions:

ADMINISTRATIVE CONDITIONS

1. The attached **Acceptance of Conditions** form must be completed and returned to ahp.central@dpi.nsw.gov.au before any works authorised by this permit commence.
   Reason – To remove any doubt that the Permit Holder understands and accepts the Conditions before work commences.
2. The attached **Commence Works Notification** form must be completed and sent to ahp.central@dpi.nsw.gov.au **and** fisheries.compliance@dpi.nsw.gov.au at least three (3) days BEFORE the commencement of works authorised by this permit.
   Reason - To ensure that local DPI Fisheries staff are aware that works authorised by this permit are about to commence.
3. The attached **Post Works Notification** form, including clearly labelled site photographs of the completed works, must be completed and sent to ahp.central@dpi.nsw.gov.au, fisheries.compliance@dpi.nsw.gov.au within 21 days of completion of works at the site.
   Reason - To provide an opportunity for local DPI Fisheries staff to inspect the site to ensure that riparian restoration works have been adequately completed consistent with the authority of this permit.
4. The permit holder must ensure that all works authorised by this permit are restricted to the permit area and are undertaken in a manner consistent with those described in the application made to DPI Fisheries dated 26 June 2023. In particular, all the actions and recommendations outlined in the REF *Tweed River flood restoration works, Dum Dum and Uki* are to be followed. Other works which have not been described, excepting those activities required by this permit, are not to be undertaken.
   Reason – This permit has been granted following an assessment of the potential impacts of the described works upon the aquatic and neighbouring environments. Other works, which were not described in the application have not been assessed and may have significant adverse impacts.
5. This permit (or a true copy), a copy of the determined Part V Assessment, CEMP and other approvals such as landholder's consent must be carried by the permit holder or sub-contractor operating on-site at all times during work activity in the permit area.
   Reason – A DPI Fisheries Compliance Officer may wish to check compliance of works with imposed conditions.

SEDIMENT AND EROSION CONTROL PLAN

6. Erosion and sediment mitigation devices are to be erected in a manner consistent with the plan shown in Attachment 3 & 4 of this permit and currently accepted Best Management Practice (i.e. Landcom [2004], *Managing Urban Stormwater: Soils and Construction* [4th Edition]) to prevent the entry of sediment into the waterway, or mobilisation of sediment within the waterway, **prior to** any earthworks being undertaken. **These erosion and sediment devices are to be maintained in good working order for the whole duration of the river bed and bank stabilisation works and subsequently until the worksite has been stabilised and the risk of erosion and sediment movement from the site is minimal.**
   Reason – To ensure that sediment generated by the exposure of soil is not transported into the main water body.

WORK IN WATERS

7. Machinery is not to enter or work from the waterway unless in accordance with works proposed in your application for the permit and the requirements of this permit.
Reason – To ensure minimal risk of water pollution from oil or petroleum products and to minimise disturbance to the streambed substrate.

8. Only clean rock is to be used in construction of works authorised by this permit.
Reason – To avoid fines, clay and other sediment un-necessarily entering the waterway and potentially impacting on aquatic habitats.

9. Geotextile fabric is to be used to underlay the rock used to armour the bank.
Reason – Consistent with best management practice and reduce the potential for the bank to continue to erode behind the rock armouring.

10. Rocks forming the bank armouring are to be placed into position using a rock grab or excavator. Rocks forming the toe are to be keyed into the bed through a process of pushing from above as opposed to excavation of a trench. Minor excavation of bed material is permitted if the substrate at a site does not allow keying in of rock through pushing weight of the excavator.
Reason – To ensure rock armouring is constructed using Best Management Practice techniques.

11. Prior to use at the site machinery is to be appropriately cleaned, degreased and serviced. Emergency Spill Kits appropriate for containing and cleaning up petroleum and solvent product spills within waterways are to be available on site at all times during works.
Reason – To reduce the threat of an unintended pollution incident impacting upon the aquatic environment.

12. A floating hydrocarbon boom and silt curtain that extends for the full depth of the water column is to be used to isolate instream works and minimise the impacts of turbidity and mobilised sediment during the construction. The floating boom and attached silt curtain are to be deployed consistent with currently accepted Best Management Practice (i.e. Landcom [2004], *Managing Urban Stormwater: Soils and Construction* [4th Edition])[1] and as depicted in Attachment 2 of this permit. The curtain and boom are to be installed, prior to commencement of any instream works and retained until after the completion of works that risk mobilising sediment. The curtain is to be maintained to ensure it operates effectively.
Reason – Minimise the impact of turbidity generated from the works upon the aquatic environment.

TIMING OF WORKS FOR LOW FLOWS

13. Works are to be undertaken during low flows in Tweed River and when Bureau of Meteorology forecast for the Northern Rivers district forecast region (available at: www.bom.gov.au/nsw/forecasts/map.shtml) indicates several days of clear, dry weather.
Reason – Timing the works for appropriate conditions can reduce delays and minimise impacts on the aquatic environments.

[1] Available at: www.environment.nsw.gov.au/research-and-publications/managing-urban-stormwater-soils-and-construction-volume-1-4th-editon

AVOIDING MOVING OR HARMING SNAGS, AND RIPARIAN AND AQUATIC VEGETATION

14. When working near aquatic vegetation[2] (phragmites and other aquatic vegetation) on water land[3], these areas are to be identified and appropriately delineated as "No Go" areas (with the aim of avoiding harm to these areas). Harm to aquatic vegetation including removing or moving vegetation on water land outside the permit area approved under the authority of this permit is not permitted. Such removal, harm or movement caused to aquatic vegetation is to be documented and reported to the contact officer who may direct that the removed, harmed or damaged aquatic vegetation on water land be restored.
Reason – To ensure that impacts on aquatic habitats and the riparian zone are minimised.

15. Material storage and stockpiling is not to be undertaken on water land, riparian or aquatic vegetation. Stockpiling must be undertaken in a manner to avoid harm to these types of vegetation or water land. Stockpiles should also be located 40 metres away from adjacent water land. Stockpiles should be appropriately controlled by sediment fencing or other materials prescribed in the "Blue Book" (i.e. Landcom 2004, *Managing Urban Stormwater: Soils and Construction* [4th Edition]) to ensure sediments do not enter the waterway.
Reason – To ensure that impacts on aquatic habitats and the riparian zone are minimised. "Degradation of native riparian vegetation along NSW water courses" is listed as a Key Threatening Process under the provisions of the Fisheries Management Act 1994.

16. No snags[4] outside of the works area described in the permit application are to be removed, realigned or relocated without first obtaining the authority of the Senior Fisheries Manager, Coastal Systems.
Reason – "Removal of large woody debris from NSW rivers and streams" is listed as a Key Threatening Process under the provisions of the Fisheries Management Act 1994. This approval has been granted on the basis that snags are not to be removed.

17. On completion of the works, the worksite is to be rehabilitated and stabilised including:
- Removal of surplus construction materials and temporary structures (other than silt fences and other erosion and sediment control devices) installed during the course of the works.
Reason – To ensure that habitats are restored as quickly as possible, public safety is not compromised, aesthetic values are not degraded and sediment inputs into the waterway are reduced.

---

[2] "***Aquatic vegetation***" is defined in the *Fisheries Management (General) Regulation* 2019 as 'native vegetation that inhabits freshwater but does not include noxious weeds within the meaning of the *Noxious Weeds Act 1993*.'

[3] "***Water land***" is defined in the *Fisheries Management Act 1994* and means land submerged by water:

a) whether permanently or intermittently, or
b) whether forming an artificial or natural body of water,

and includes wetlands and any other land prescribed by the regulations.

Wetlands include marshes, mangroves, swamps, or other areas that form a shallow body of water when inundated intermittently or permanently with fresh, brackish or salt water, and where the inundation determines the type and productivity of the soils and the plant and animal communities.

[4] "***Snags***" is a term used to describe **large woody debris** from trees and shrubs, including whole fallen trees, broken branches and exposed roots that have fallen or washed into a waterway and are now wholly or partially submerged by water. Snags also includes submerged large rocks (of greater than 500 mm in two dimensions).

FISH KILL CONTINGENCY

18. A visual inspection of the waterway for dead or distressed fish (indicated by fish gasping at the water surface, fish crowding in pools or at the creek's banks) is to be undertaken twice daily during the works. **Observations of dead or distressed fish are to be immediately reported to the Contact Officer by the Permit Holder.** In such a case all works are to cease until the issue is rectified and approval is given to proceed. If requested, the Permit Holder is to commit resources to the satisfaction of the Contact Officer for an effective fish rescue, if in the view of that officer, a fish kill event is imminent and likely to occur within or adjacent to the works area due to conditions associated with weather, water quality and other parameters.
Reason – DPI Fisheries needs to be aware of fish kills so that it can assess the cause and mitigate further incidents in consultation with relevant authorities. They are also potentially contentious incidents from the public perspective. Work practices may need to be modified to reduce the impacts upon the aquatic environment.

IMPORTANT NOTE:

INCONSISTENCY BETWEEN DOCUMENTS

In the event of any inconsistency between the conditions of this approval and:
- the drawings / documents referred to above, the conditions of this approval prevail to the extent of the inconsistency;
- any Government publication referred in this permit, the most recent document, shall prevail to the extent of the inconsistency; and
- the proponent's mitigation measures outlined in the application, the conditions of this approval prevail to the extent of the inconsistency.

STOP WORK ORDERS

A Fisheries Officer or other appropriate delegate who has reasonable cause to suspect that the conditions of this permit have not been complied with, **may order the work to stop immediately**. The order may be given to the permit holder or any person who informs the officer that they are acting in any capacity on behalf of the permit holder. Any damage caused to the habitat outside the specified permit area, or the carrying out of works not in accordance with the conditions specified in this permit and/or the application and that were accepted by the permit holder, could result in a breach of the *Fisheries Management Act 1994* or *Regulations*, and penalties of up to $220,000 may apply. Orders may also be made requiring work to rectify any damage caused by unauthorised works. Failure to abide by permit conditions may incur a $500 on-the-spot fine per breach pursuant to clause 225 of the *Fisheries Management (General) Regulations 2019*.

Authorised:

[redacted]

Senior Fisheries Manager, Coastal Systems (North Coast)
Marine Estate Management, Primary Industries NSW
Authorised delegate of the Minister for Agriculture

19 July 2023

Attachment 1

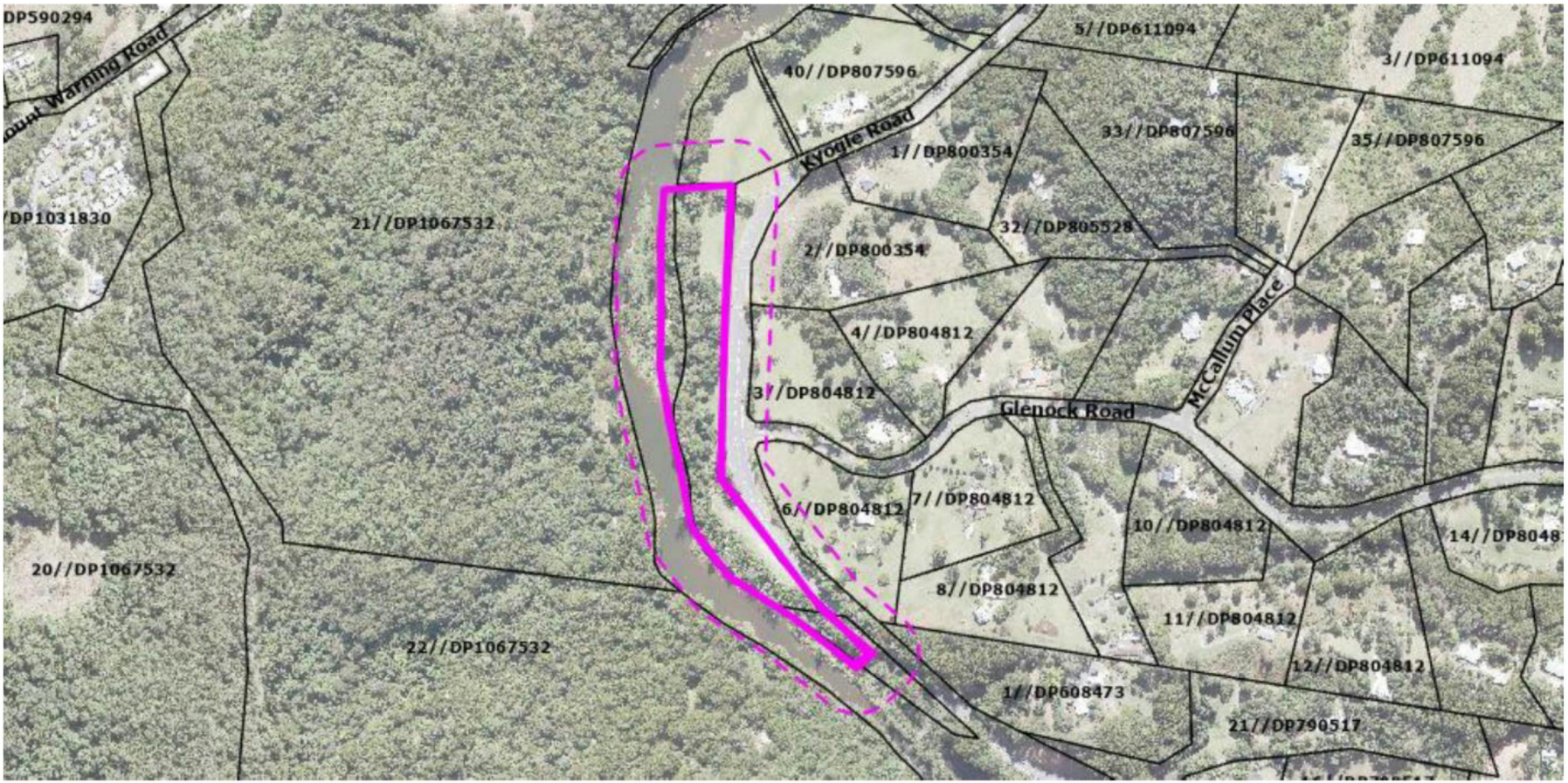


Figure 1: Plan showing location of river bed and bank stabilisation works as described within the *Permit Area* section above.

Attachment 2

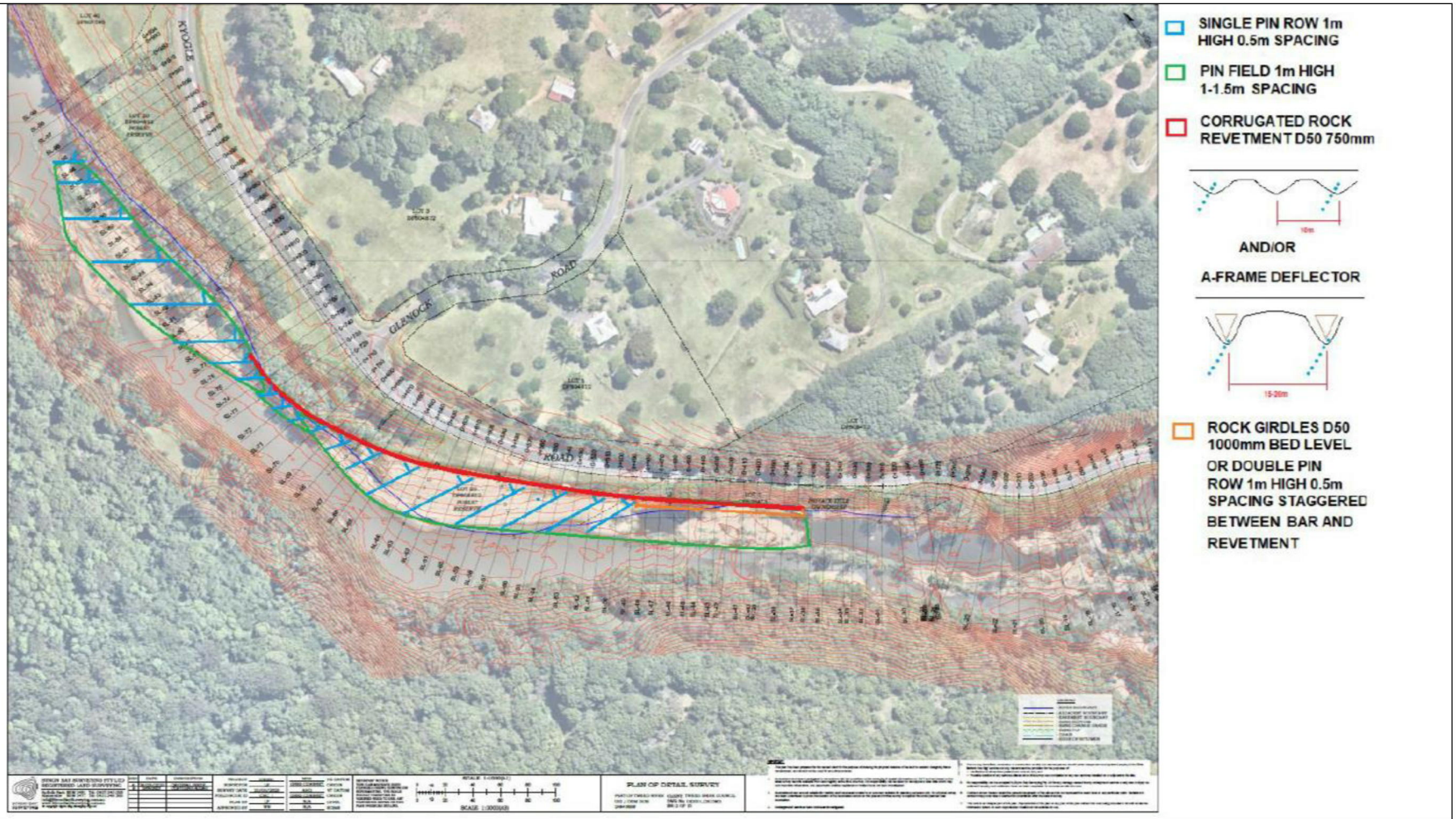


Figure 1: Proposed design of river bed and bank stabilisation works as described within the *Permit Activity* section above.

Attachment 2

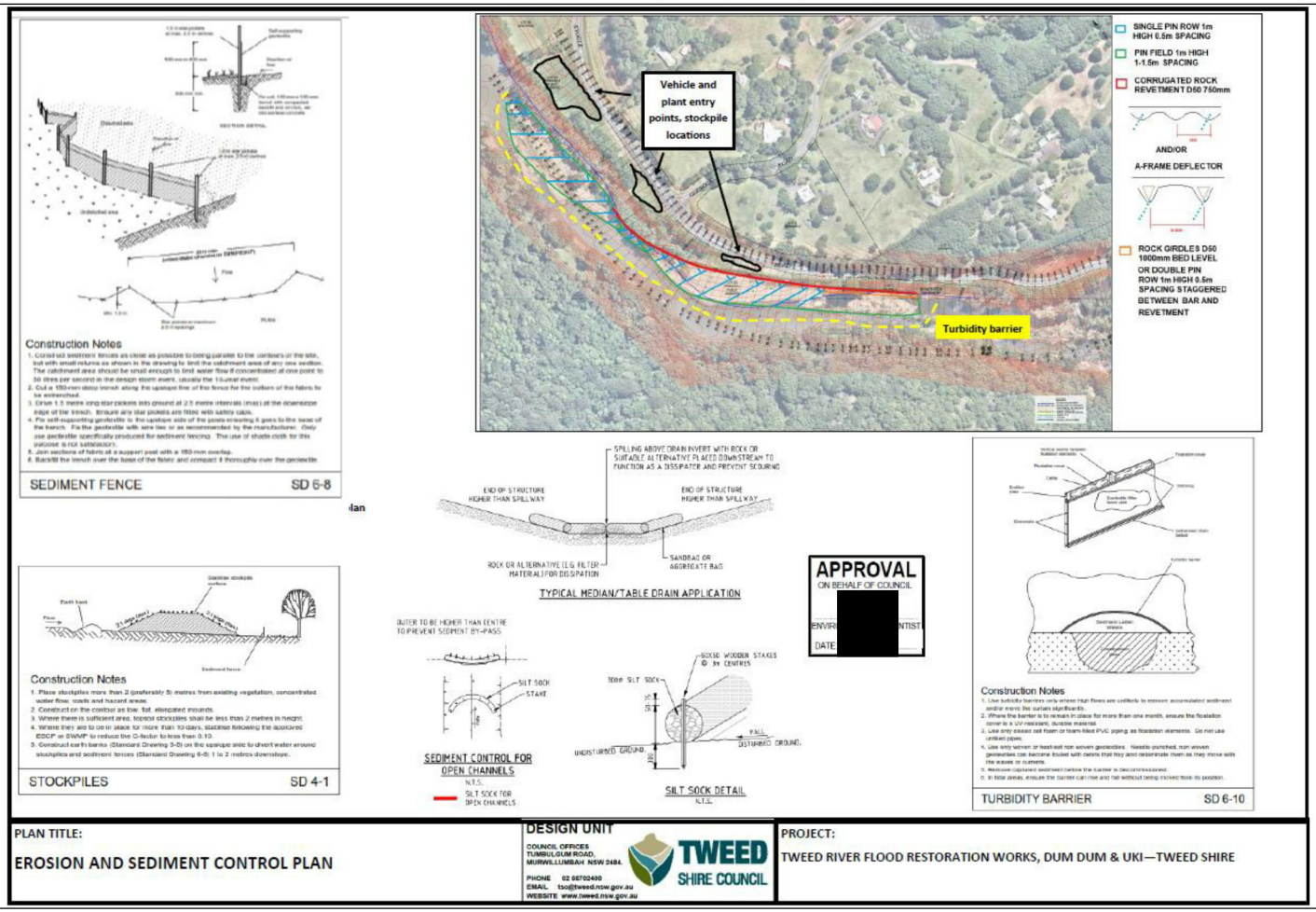


Figure 2: Site layout plan for proposed river bed and bank stabilisation works including minimum sediment and erosion control actions as described within the *Permit Activity* section above.

Attachment 3

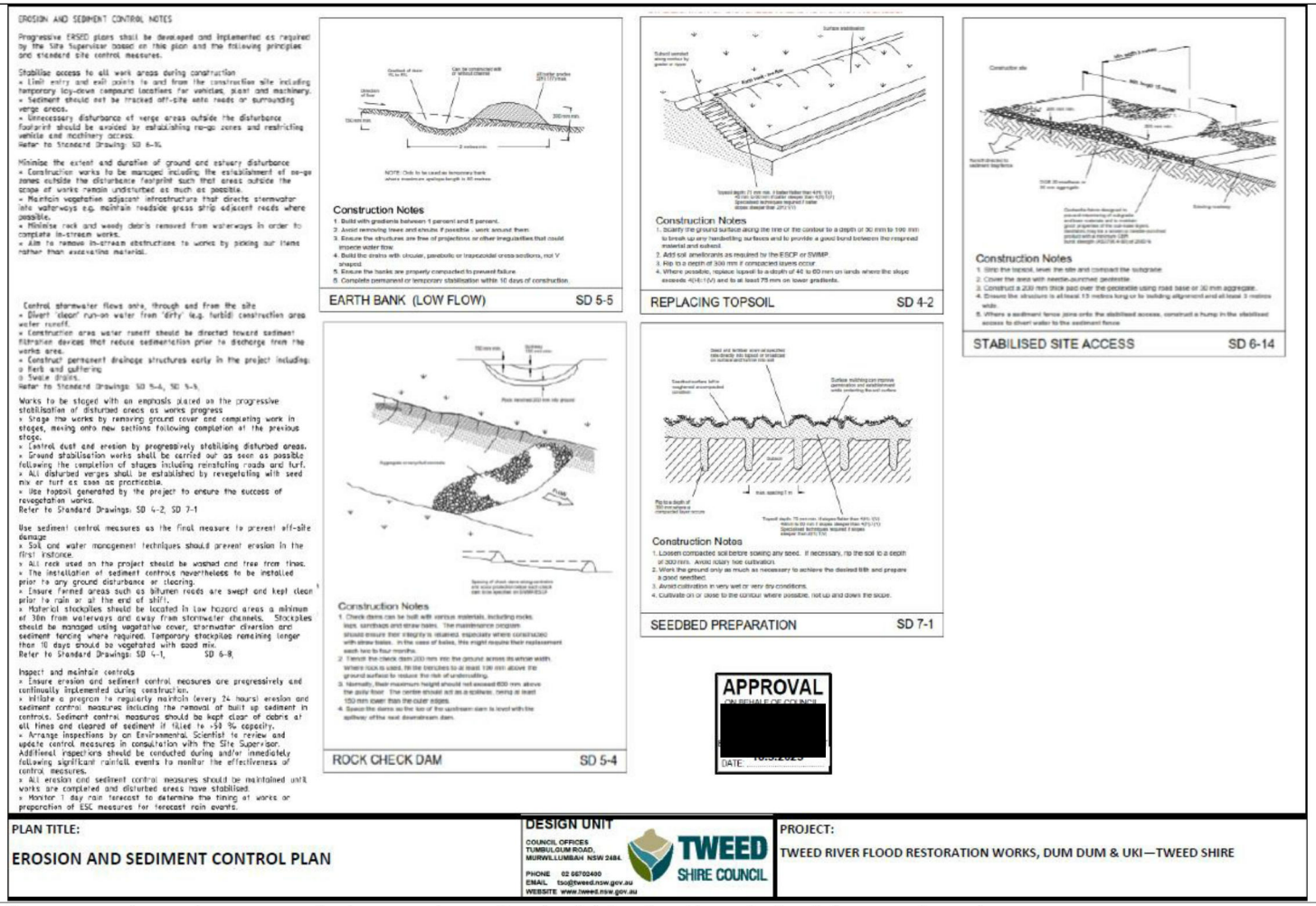


Figure 1: Sediment and erosion control plan as described within the *Permit Activity* section above.

[redacted]ditions Form specified in [redacted] issued under Part 7 of the *Fisheries Management Act 1994*

PLEASE COPY THIS PAGE AND RETURN TO DPI FISHERIES

In reference to Permit No. [redacted] for dredging and reclamation work associated with river bed and bank stabilisation works within the Tweed River, Lot 1 DP 608473 & Lot 20 DP 804812, Uki, Tweed Shire Council LGA:

[redacted]

Commence Works Notification Form specified in Permit No. [redacted] issued under Part 7 of the *Fisheries Management Act 1994*

PLEASE COPY THIS PAGE AND RETURN TO DPI FISHERIES

[redacted]

ahp.central@dpi.nsw.gov.au
fisheries.compliance@dpi.nsw.gov.au

Post Works Notification Form specified in Permit No. [redacted] issued under Part 7 of the *Fisheries Management Act 1994*

PLEASE COPY THIS PAGE AND RETURN TO DPI FISHERIES

[redacted]

Please COPY AND SIGN this page and return with clearly labelled photographs via email to:

ahp.central@dpi.nsw.gov.au
fisheries.compliance@dpi.nsw.gov.au

Contact and connect

02 6670 2400

tweed.nsw.gov.au
tsc@tweed.nsw.gov.au
PO Box 819 Murwillumbah NSW 2486