TWEED SHIRE COUNCIL

Review of Environmental Factors

Cudgen Creek beach bank stabilisation, Robert Dixon Park, Kingscliff

July 2022

Version control

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1.0 Draft for internal review	11/7/2022	Environmental Scientist Unit	Environmental Scientist Unit
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1.2 Final	15/8/2022	Environmental Scientist Unit	Environmental Scientist Unit

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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 of 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 1.1: Project details

Project Details	
Project Name	Cudgen Creek Beach Bank Stabilisation
Project Location	Robert Dixon Park and Cudgen Creek, Kingscliff (refer to Figure 1 for site location)
Project Owner	Tweed Shire Council
Project Brief Number	No brief
Environmental Scientist (assessing officer)	[redacted]
Determining Officer	
Project Client	
Project Manager	

2.0 Site details

Table 2.1: Site details

Site / Parcel description	Zoning	Land owner
Lot 7056 DP1113366	DM – Deferred Matter TLEP 2014, refer to previous LEP 2000 zoned as 6(a) – Open Space	Crown – Council Managed (refer to Figure 2 for zoning and Figure 3 for land tenure)
Lot 489 DP47021	DM – Deferred Matter TLEP 2014, refer to previous LEP 2000 zoned as 6(a) – Open Space	Crown – Council Managed

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 through 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 flooding have caused the erosion of the Cudgen Creek waterway bank and therefore loss of land. The location of the erosion is within a popular public park

Description	Comment
	(Robert Dixon Park) where the public gain access to the waterway beach for swimming, fishing and other recreational activities. To stabilise the bank, and provide safe access to Cudgen Creek for the public it is proposed that geotextile sand containers (geobag) revetment and stairs be constructed and installed. Revegetation will also be undertaken at the top of the bank to provide stability in the long term.
Alternatives considered	Alternative revetment options were considered such as rock revetment, however assessment by Alluvium Consulting determined that the geobag revetment and providing a stair access was the preferred option for successfully stabilising the bank against fluvial action and further rain events and flooding, providing a safe access for the public via the stairs and was the most cost effective. Tweed Shire Council is aware of the amenity value of the Cudgen Creek beaches used by the general public in this area and determined that using rock revetment would cause the beaches to no longer be able to be used. The geobag revetment proposed will allow for the beaches to remain retaining the amenity value of the area.
Proposal description key project elements (e.g. nature, scale and extent of proposed activity)	The subject site is located in the bed and banks on the southern side of Cudgen Creek and within Robert Dixon Park. It is in proximity to a formalised road within the park that allows vehicular access to the northern end of the Kingscliff back beach peninsula. To stabilise the creek bank, reduce further erosion from occurring and to make it a safe area for the public it is proposed that geobag revetment will be constructed and installed. To allow the public to continue to access the beach, aluminium stairs will be installed after the geobag installation. An existing concrete platform that is unused is present within the subject site and it will be removed as part of these works. Revegetation will also be undertaken at the top of the bank to assist with long-term stability of the creek bank. The approximate length of the subject site is 30 m, and the width is up to approximately 5 m. The height of the revetment varies between approximately 1 m and 4 m Australian Height Datum (AHD). Refer to Appendix A for the concept design for the subject site and imagery and placement of the extent of works proposed.

Description	Comment
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: • the installation of environmental controls including sediment and erosion control and vegetation protection zones • cordoning off the works area from the public via fencing or tape and displaying signage • the removal of the existing concrete platform at downstream extent of subject site • minor earthworks to create base for geobag revetment and installation of geofabric • the installation of screw pile foundations for aluminium access stair (prior to geobag installation) • the installation of 0.75 m^3 of vandal proof sand filled geobag revetment at a minimum slope of 1V:1H • back filling of material where required against layer of geofabric • partially filled geobags installed on lower bank of west facing dune scarp to be placed against bank surface • the installation of aluminium access stair (following geobag installation) • the establishment of riparian vegetation along the upper bank and overbank zone (2–3 m) • the stabilisation of any other disturbed surfaces • the removal of environmental controls once work has been completed • the removal of the cordoned of fencing or tape so access for the public is restored.
Ancillary facilities (e.g. site compounds, stockpiles, set down areas, vegetation clearing and protection requirements, sensitive receivers etc.)	Ancillary activities associated with the bank stabilisation and pedestrian access strains would include: • establishment of a suitable access path to the site to enable the delivery of materials • material stockpiling • equipment laydown • environmental management activities (including erosion and sediment control and vegetation protection measures) All ancillary activities would be undertaken in previously cleared areas adjacent the disturbance footprint.
Property access and acquisition requirements	The proposed works occur within the bed and banks of Cudgen Creek, however, in this location the section of waterway is a legal parcel of land (Lot 7056 DP1113366) that is Council managed Crown land. Access to the site is generally unrestricted to the general public and access for undertaking works will be available via the vehicular access within the park where the entrance is off Casuarina Way.

Description	Comment
Estimated construction commencement date	August 2022
Estimated construction completion date	September 2022
Estimated cost of works	[redacted]
Construction hours	Monday to Saturday 7 am to 6 pm, no work on 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 comprises land within Robert Dixon Park which extends to the bed and banks of Cudgen Creek. The disturbance footprint is generally cleared of vegetation and is a mown area within the park. Some surrounding vegetation and park amenity trees are adjacent the subject site. The Tweed Vegetation Management Strategy (TVMS) mapping (Kingston et al, 2004) identifies two vegetation communities as occurring within the study area, being 'Substantially Cleared of Native Vegetation' and 'Not Assessed'. Site surveys confirmed the subject site was substantially cleared of vegetation with only mown grass present, a Horsetail she-oak (*Casuarina equisetifolia*) present on the edge of the eroded bank and Cottonwoods (*Hibiscus tiliaceus*) present on the downstream edge of the subject site.
Surface water and ground water	The subject site is located on the banks of Cudgen Creek. All works are above the mean high water mark (MHWM).
Flood prone land	The site within the confines of Cudgen Creek is mapped as being flood affected with a 1 in 100 year flood level of 2.6m AHD. .
Soils and geology	There are no soil landscapes (Morand, 1996) mapped for the subject site area. Historically the sand peninsular was sand-mined (refer to Figure 4) and then the mouth of Cudgen Creek was manipulated and constructed. It is possible that the subject site has Disturbed Terrain (xx) soils present, however if soils were not disturbed from mining or creek mouth works it is possible that the soil landscapes would be the same as those adjacent either the Bogangar (bo) or Angels Beach (ab) soil landscapes. The Disturbed Terrain soil landscape is described as made land varying form level plains to undulating terrain which has been disturbed by human activity to a depth of at least 100 cm. The original soil has been removed, greatly disturbed or buried. Landfill includes soil, rock, building and waste material. The original vegetation has been completely cleared.

Description	Comment
	The Bogangar soil landscape is described as very disturbed outer barrier (Holocene) dunes. Vegetation of this landscape is described as very disturbed open-heathland and heath. Soils of this landscape are described as deep (>300 cm), very disturbed Podzols and Siliceous Sands. The Angels Beach soil landscape is described as barrier beaches and associated foredunes on Quaternary (Holocene) sands. Beach plains, foredunes and hind dunes that have been disturbed. Vegetation of this landscape is described as spinifex grassland/herbland to closed scrub on dunes. Soils of this landscape are described as deep (>200 cm), rapidly drained Siliceous Sands and some Calcareous Sands on beaches. Predominantly deep (>200 cm), rapidly drained Siliceous Sands on foredunes.
Bushfire risk	The subject site is located within a Vegetation Category 2 (low risk) and Vegetation Buffer bushfire prone area as per the Bushfire Prone Land mapping 2012.
Coastal hazards	The subject site is located outside of the coastal hazard zone as per the Tweed Shire Coastal Hazards Assessment completed in November 2013.
Extreme climate/weather events	The subject site is prone to extreme climate and weather events. From November 2021 through 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 flooding have caused the erosion of the Cudgen Creek waterway bank and therefore loss of land.
Traffic and transport	The subject site is within a public park area and adjacent to Cudgen Creek. A formalised vehicular road that travels through the park is present nearby to the subject site. The road and park are used by vehicles, pedestrians and cyclists.
Noise and vibration	The subject site is situated within a public park between Cudgen Creek and the back beaches of Kingscliff. The subject site is considered to be a moderate noise environment with background sources of noise at the site include boat traffic on Cudgen Creek, wave action from the nearby beaches and vehicular traffic from the roads in Kingscliff and within the park. Noise from the general public is also experienced from users of the creek and the park area.
Scenic value	The subject site is adjacent to Cudgen Creek however is considered to have a low scenic value according to the Tweed Shire Draft Scenic Landscape Strategy mapping.
Property and land use	The proposed disturbance footprint occurs within Robert Dixon Park and the bed and banks of Cudgen Creek (within

Description	Comment
	Lot 7056 DP1113366) which is Council managed Crown Land. Works do not enter the mapped boundaries of Cudgen Creek which is a Crown Land Waterway.
Public access	The proposed disturbance footprint comprises of the park area which has unrestricted access available to the public. The subject site may also be accessed from Cudgen Creek whereby public access is also unrestricted.
Aboriginal heritage and historic (non-Aboriginal) heritage	According to the Tweed Shire Aboriginal Cultural Heritage Management Plan (ACHMP) the site is [redacted] The subject site does not have any State or local significant heritage items mapped as occurring.
Any other environmental elements	The proposed disturbance footprint is mapped as occurring within a Class 4 ASS area.

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 specified development. Section 2.15(1) states that a public authority must not carry out specified development that this Policy provides may be 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 works would be advertised to the public prior to their commencement through on site signage and media releases via social media channels and the Tweed Link.

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 Section 2.164 Development permitted without consent

Description	Comment
Controlling provisions / performance criteria	(1) Despite section 2.164, 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. (3) In this section, a reference to development for the purpose of waterway or foreshore management activities includes a reference to development for any of the following purposes of the development is in connection with waterway or foreshore management activities— (a) construction works (b) routine maintenance works (c) emergency works, including works required as a result of flooding, storms or erosion (d) environmental management works.
Comments	Section 2.163 Definition ***waterway or foreshore management activities*** means— (a) riparian corridor and bank management, including erosion control, bank stabilisation, resnagging, weed management, revegetation and the creation of foreshore access ways.

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	A number of construction options were investigated during the preliminary design phase which included different options to manage the erosion and pedestrian access. The proposed design is the most suitable for the location and will minimise further environmental impacts. <u>Avoid</u> The creek bank erosion is required to be stabilised to ensure further land loss does not occur and to make the park area safe for the general public to use. The proposed design avoids reducing the creek beach extents by using geobag revetment rather than rock revetment which would have a larger footprint area. <u>Minimise</u> Designs and strategies have been proposed to stabilise the bank with the least amount of impact to existing native vegetation. All vegetation will attempt to be protected however where vegetation is deemed to be unsafe for the general public due to damage to root zones, it may be removed. <u>Offsets</u>

Description	Comment
	Due to minor impacts expected, offsets are not proposed. However, native revegetation is proposed as part of the bank stabilisation works and will improve the immediate habitat area.

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

4.1 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 4.1: Environmental planning, cultural, and community impact considerations and assessment

Item	Impact considerations	Relevance to proposal? (Yes/No)	Impact identification and assessment (Direct, indirect and cumulative; consider type, extent, size, duration, importance, level of concern/interest) (Consider construction & operation)	Impact evaluation[1] (Low, medium, high)[2]	Mitigation actions[#] (See notes below)
Environmental and ecological considerations					
1	Does the subject site contain Environmental Protection Zones (as defined under the Tweed LEP 2014)?	No	Under the Tweed LEP (TLEP) 2014 the subject site is zoned DM – Deferred Matter. Under the TLEP 2000 (as at 2014) the subject site was zoned 6(a) – Open Space. The subject site is not located within any Environmental Protection Zones.	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,	No	Refer to Appendix B for the assessment of the matters of NES. No matters of NES are within the subject site.	N/A	N/A

Item	Impact considerations	Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
	National Heritage, nature reserve etc.) or on Commonwealth land (refer Commonwealth Department of Agriculture, Water and the Environment)?				
4	Will the project impact upon Matters of NES described above?	No	N/A	N/A	N/A
5	Are works within or near areas protected by State Environmental Planning Policies (SEPP) for conservation purposes?	Yes	The subject site is located within the land application areas of the State Environmental Planning Policy (Resilience and Hazards) 2021 (R&H SEPP). Division 3 and Division 4 of the SEPP relate to Development consent and does not apply to Part 5 of the EP&A Act in this instance. The subject site is within the land application areas of the State Environmental Planning Policy (Biodiversity and Conservation) 2021 (B&C SEPP). Chapter 2 of the SEPP relates to vegetation in non-rural areas and clearing requirements. Vegetation in the disturbance footprint is proposed to be protected, however if it is deemed to be a hazard to the safety of the general public post construction, it will be lopped or removed. Refer to Appendix C for further information on vegetation.	Low	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	A preliminary Flora and Fauna assessment did not identify any NSW endangered or vulnerable species, populations or their ecological communities or their habitats within the subject site. Refer to Appendix C for an assessment of impacts to flora and fauna. [redacted]	N/A Low	A, C, G
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	All of the above identified 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. Bush stone-curlew are known to occur within Robert Dixon Park to the immediate south of the disturbance footprint. [redacted] Given the breeding site-fidelity exhibited by this species, they are unlikely to use the habitat within the disturbance footprint for breeding in the short to medium term. They may pass through the site on occasion to forage for food although are more likely to be attracted to the native vegetation to the east of the subject site where cover is present. [redacted]	Low	A, C, G

Item	Impact considerations	Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
			occasionally use the beaches within Cudgen Creek for foraging. [redacted] are all fish eaters and so foraging within the study area would be limited to Cudgen Creek and the open ocean. They may temporarily perch within the study area as they move through the landscape. It is unlikely that the project would impact upon threatened species, populations, ecological communities or their habitats during or post-construction. Refer to Appendix C for further information.		
8	Does the subject site contain, or is the site adjacent to a flying-fox colony?	No	The nearest flying-fox colony is [redacted] and is sufficiently removed from the proposed disturbance footprint. Impacts on the colony or their feeding habitat are not expected during or post-construction.	Low	A
9	Does the subject site contain, or is the site adjacent to a raptor nest?	Yes	The nearest raptor nest is [redacted] The [redacted] are considered likely to fly over the subject site. They are not considered likely to be impacted by the works as the disturbance footprint is small-scale in comparison to their home ranges, is short-term [redacted] it is considered unlikely that the proposed works will significantly impact this species during or post-construction.	Low	A
10	Does the subject site contain habitat areas falling within an identified wildlife corridor?	Yes	The subject site is within a regional wildlife corridor. The proposed works of stabilising the eroded bank and revegetating the top of the bank are unlikely to negatively impact the wildlife corridor. Long-term positive impacts post-construction will include improving habitat connectivity, water quality, soil stability and reduce erosion.	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,	Yes	Native vegetation within the proposed disturbance footprint is limited. The majority of vegetation that will be impacted is exotic mown groundcovers including grasses and herbs. A single Horsetail she-oak is present on the top of the eroded bank. The proposed works will try to work around this existing tree, however if it is likely that the tree would be damaged and the likelihood of it surviving is greatly reduced or it poses a risk to the safety of the public, it will be removed. On the downstream side of the disturbance footprint, a Cottonwood is present. Erosion has occurred underneath this shrub and works may be required to stabilise the area. It is likely	Low	A

Item	Impact considerations	Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
	woodlands, open forests and rainforests?		that one Cottonwood will be required to be pruned or removed to allow for the geobag revetment to be constructed. Post-construction works, revegetation on top of the bank will occur. Revegetation will include a variety of native groundcover, shrub and tree species specific to the Cudgen Creek riparian zone and will enhance the local habitats. No marine vegetation will be affected.		
12	Removing or lopping trees within an area mapped under a Tree Preservation Order?	Yes	The subject site is within the mapped Tree Preservation Order (Koala habitat) mapping. Vegetation that is required to be removed or lopped are not listed as Koala use or food tree species. A permit is not required to prune or remove these trees.	Low	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 activity constitutes dredge and reclamation works under the Fisheries Management Act 1994 (FM Act). Accordingly, a referral would be made to the NSW Department of Primary Industries (DPI) Fisheries to assess the proposal under Part 7 of the FM Act.	Low	A, B
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?	No	Although the proposed works occur within the bed and banks of Cudgen Creek, the disturbance footprint is contained within the boundary of Lot 7056 DP1113366 which is Council managed Crown Land. Accordingly, the works would not enter the mapped waterway of Cudgen Creek and a Crown Land licence is not required for the project.	N/A	N/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	No	N/A	N/A	N/A

Item	Impact considerations	Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions#
	and State Heritage Registers, Schedules of the Tweed Local Environmental Plan 2014 (TLEP))?				
18	Are works within or adjacent to a mapped predictive or known location of Aboriginal Cultural Heritage (ACH) identified in the 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?	No	[redacted]Refer to section 4.5 and Appendix D for further assessment and information.	Low	A
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	N/A
21	Involve discharging anything to a waterway or stormwater drain?	Yes	Runoff from the subject site during construction is expected to enter Cudgen Creek. Mitigation measures including erosion and sediment controls will be implemented	Low	A

Item	Impact considerations	Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
			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 will be stabilised and controls will be removed. It is expected that there would be negligible impacts on waterways post-construction.		
22	Disturb subsurface or above ground utilities – Country Energy, Telstra, local council water and sewer?	No	N/A	N/A	N/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	The subject site is mapped as being within a Class 4 ASS areas. Given the shallow nature of the works and the limited earthworks proposed, the proposal is unlikely to impact upon ASS during construction or post-construction. Refer to Section 4.4 for additional information regarding ASS.	Low	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	Works would inherently result in the increase of noise at the site during construction. As the proposed works are short-term and mitigation measures are proposed to minimise the potential impacts associated with the proposed construction works, noise impacts are considered negligible. Post-construction, noise generating activities would no longer be undertaken.	Low	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	Traffic within the park area is generally limited to park and beach goers. The road allows for parking in different areas within the park. It is expected that traffic volumes would be greater on weekends and outside of the normal 9 am to 5 pm work hours. Traffic volumes would also be greater during public holidays and school holiday periods. The proposed works are not expected to impact access to the road or to any parking areas, however an increase in vehicles accessing the site would be experienced. Post-construction, access would be similar to that prior to construction.	Low	A
Will works occur in other sensitive or constrained areas as outlined below?					

Item	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	Construction works are located within proximity to Cudgen Creek. Mitigation measures would be implemented so as to not negatively impact this feature. Post-construction, it is expected that the waterway and disturbance footprint would be improved due to the erosion stability works and revegetation having been undertaken.	Low	A
31	Areas or items of high scenic value?	Yes	The proposed project is located in proximity to Cudgen Creek in Robert Dixon Park, Kingscliff. The subject site has low visibility (as per the Draft Scenic Landscape Strategy Interactive Mapping Tool) from people being able to view the area from the opposite side of the creek. However, a greater number of people are able to view the proposed subject site via accessing the park. The project is routine in nature and is required to stabilise the eroding bank. Revegetation will follow the construction works. Access stairs will be provided as part of the scope of works to allow people to continue to access not only the creek but the creek beaches also. It has been determined that based on the location and scope of works a basic visual impact assessment is satisfactory. Prior to construction the subject site is typical of a public waterway park. During construction the site will have an increase in machinery and personnel, geobags will be installed, access stairs will be installed and revegetation on top of the bank will be undertaken. There is no proposed impact to Cudgen Creek, this will be protected. In the short-term, negligible adverse visual impacts would be experienced by park goers. Post-construction, the subject site would be similar to that prior to works, with revegetation of local species having also been undertaken. Installation of stairs will be new to this location within the park, however this will provide a safe and easy access for pedestrians to access the creek. Post-construction, it is predicted that visual impacts will not be any different to that prior to works. The Scenic Management Principles will be achieved as the proposed development will protect the Cudgen Creek and thereby the scenic character.	Low	A

Item	Impact considerations	Relevance to proposal?	Impact identification and assessment	Impact evaluation[1]	Mitigation actions[#]
			Additionally, adding revegetation to the Cudgen Creek riparian area will increase tree cover to improve the scenic visibility for park and waterway users.		
32	Recreational areas (beaches, foreshores, parks, picnic areas, lookouts, national features, tourist areas, tourist roads/routes etc.)?	Yes	The location of the proposed works is within Robert Dixon Park, a highly used foreshore park in Kingscliff. Currently, pedestrian access to the creek for recreational activities is gained via the eroding bank and existing rock revetment. Access via the waterway is unrestricted. During construction, access to the disturbance footprint will be restricted and mitigation measures proposed will minimise potential impacts. After construction, pedestrian access will be improved through the installation of stairs and access to the use of the small section of park within the subject site will return.	Low	A
33	Erosion prone areas?	Yes	The subject site is not classified as steep or highly erodible lands, however, erosion has occurred due to the extreme weather and flooding event experienced in March 2022. Erosion has occurred which has led to vegetation being lost. To mitigate the erosion and to prevent further erosion and loss of land occurring, the proposed works include the construction of revetment using geobags and undertaking revegetation. Installing access stairs will reduce foot traffic that may increase erosion in the area. The flooding of Cudgen Creek is considered to have a medium impact on the bank stabilisation causing erosion to the subject site. The likelihood of continuing erosion caused by further weather events and fluvial action is high. The proposed works will mitigate these impacts and reduce the likelihood of further erosion in the long-term.	Medium	A
34	Bush regeneration areas, dune regeneration areas etc.?	No	N/A	N/A	N/A
35	Areas of high bushfire risk?	Yes	The proposed subject site is within a Vegetation Category 2 and Vegetation Buffer as identified in the Bushfire Prone Land mapping (2012). Vegetation Category 2 is considered to have a low risk.	Low	A
36	Weeds?	Yes	Proposed mitigation measures would not spread weeds.	Low	K
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.?	No	N/A	N/A	N/A
40	Works on private land?	No	N/A	N/A	N/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 8.0 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 8.0.
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.

4.2 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 4.2: 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
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

4.3 Tweed Shire Council's Contaminated Land Policy Assessment

Table 4.3: 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 1962 to 2022 indicates that the subject area forms part of the Cudgen Creek banks and dune areas of the back beaches of Kingscliff. In the 1962 aerial photograph the site was present as sand only with no vegetation. It is quite possible that the area had been sand mined as is evident to the south of the site being sand mined at the time and the presence of post-mining revegetation present to the east of the site. By 1972, the sand mining in the area had ceased and the site was present as the banks of Cudgen Creek. No vegetation was present at the site, however the post-mining revegetation had significantly matured and other low stature vegetation was present along the peninsula. Major changes to the mouth of Cudgen Creek had been undertaken prior to 1972 as break rock walls are evident diverting the creek perpendicular to the beach rather than naturally along it to the north as identified in the 1962 photography. This manipulation of the creek mouth has allowed for sand to build up on the northern side of the break wall creating more land. Comparing the 1979 imagery to the 1972 imagery it is evident that there is less sand at the subject site most likely caused by natural processes. A park has been constructed on the reclaimed land on the northern side of the break wall of the creek and vegetation on the sand peninsular adjacent to the subject site has further matured. It is evident in the 1987 imagery that the subject site has less sand again. A rock wall had been constructed at the subject site into Cudgen Creek that is perpendicular to the land. Sand mining is evident once again on the peninsula to the south and east of the subject site. In the 1991 imagery sand mining had taken over the majority of the peninsular and vegetation had once again been cleared. The subject site was on the edge of the sand mining works. By 1997 the mining works look to have been completed and vegetation on the peninsula had begun to regenerate. In the 2004 imagery it is evident that the subject site and surrounding peninsula area was turned into a public park, with mature vegetation present and open mown grassy areas for recreation. The vehicle access road is also present at this time. From this time, no major changes were evident in the 2015 and 2022 imagery. Refer to Figures 4 to 12 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.	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.	Yes. Historic mining of heavy minerals within the proposed subject site is listed as a potentially contaminating activity due to the potential presence of mineral sands tailings resulting in elevated levels of radioactivity.
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?	Yes. 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 disturbance footprint. Residue of radioactive mineral sands may be present within the subject site as a result of the heavy mineral mining that historically occurred and as such radiation testing was undertaken within the subject site. One central location of the subject site was tested using a hand-held RAM GENE-1 Contamination and Dose Rate Radiation meter (under a current calibration certificate). Levels were found to be within the normal natural background level of ~0.1µGy h 1 and did not exceed the NSW Department of Health Action Level Criterion, and as such it is unlikely that risk of harm to human health or the environment would be experienced.
5	Is the proponent aware of any contamination on the site?	No. The encountering of contaminated land within the proposed work areas are considered to be unlikely.
6	What remediation work, if any (carried out voluntarily or ordered by a government	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

Item	Consideration	Response
	agency), has been taken in respect to contamination which is or may have been present on the site?	investigations or remediation in accordance with a council approved Remediation Action Plan would be required.

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.

4.4 Preliminary acid sulfate soils assessment

Table 4.4: 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.	Yes. The 1:25000 ASS Planning maps indicate that the subject site occurs within a Class 4 mapped ASS area. Further investigations are required for any works more than 2 m below the natural ground surface in a Class 4 mapped ASS area.
2	Will the projects maximum depth of excavation impact the identified ASS class? Please specify.	No. The proposed works would involve the installation of geobag revetment whereby minor excavations (<1 m) are required to install the geofabric and geobags. Installation of stairs will be shallow and would not exceed the 2 m below the natural surface level. The removal of the existing concrete platform will not require any excavations other than to lift and/or break up the concrete for removal.
3	Has soil sampling and analysis been carried out to determine if an Acid Sulfate Soils Management Plan (ASSMP) is required? Please specify.	No. The proposed works within the Class 4 mapped ASS area would not require any excavations to 2 m below the natural ground surface level, therefore soil sampling and analysis is not required.
4	Based on the above items is an ASSMP required? Please specify.	The proposed works would not require any excavations greater than 2 m below the natural ground surface level in the Class 4 mapped ASS area. Accordingly, an ASSMP is not required for the proposal.

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 4.5: 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.

4.5 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 positive environmental impacts on the community. Benefits to the local community include having a safe public park and access to the Cudgen Creek beaches.
(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, the locality would be reflective of the current situation, however the presence of geobags, stairs and revegetation will be the minor point of difference.
(c) Any environmental impact on the ecosystems of the locality	The environmental impact on local ecosystems is expected to be minor however post-construction it will be positive ensuring that erosion within the immediate area will be reduced and the land and Cudgen Creek banks will be able to have a greater resilience to flooding and fluvial action. The reduction in erosion may also have a positive impact on water quality. The revegetation is expected to increase habitat albeit minor. The revegetation will also provide connectivity to nearby natural areas.
(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 workers and associated plant and control measures. After construction the environmental and visual quality would be improved.
(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 Aboriginal cultural heritage, aesthetic, anthropological, archaeological, architectural, or historic value. Long-term, the revegetation and increase in canopy cover and riparian vegetation is likely to have a beneficial impact on scenic quality. Community values of the immediate area would remain the same after construction as a safe access point has been provided.
(f) Any impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016)	The site is disturbed from past and current land uses. The site has minimal habitat value for fauna due to erosion and lack of vegetation. Accordingly, the proposal would not have a significant impact on habitat of protected fauna species.
(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 and current land uses. The site has minimal habitat value for fauna. The proposed works are not expected to have a negative impact on fauna including the Eastern Ospreys that would fly over the site. The proposed works would not contribute to any key threatening processes. Accordingly, the proposal would not have a significant impact on habitat relied upon by threatened, endangered or vulnerable species.

Matters for consideration	Likely impact
(h) Any long-term effects on the environment	Creek bank 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. Mitigation measures listed in Section 10 of this REF would be implemented during construction to ensure that there are no long-term negative effects on the environment. Positive effects that may occur from the works include increasing habitat due to the revegetation works proposed.
(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 8 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 and are unlikely to change or adapt current ecological processes. A range of risk management measures would be utilised during construction which are summarised in Section 8 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. After construction. the proposed works will not diminish the existing use of the public park by the community.
(l) Any pollution of the environment	Mitigation measures as listed in Section 10 of this REF would minimise the risk of pollution to the environment during works. After construction, it is expected that erosion of soil will be greatly reduced in the immediate area.
(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.
(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

Matters for consideration	Likely impact
	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. The proposed construction of geobag revetment is in an area where rock revetment already exists on the creek side of the works. 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. • Planning priority 3: Increase resilience and adapt to the impacts of natural hazards and climate change to ensure our future prosperity and wellbeing. • Planning priority 11: Cultivate a desirable and healthy lifestyle choice with a strong sense of community, diverse places for people to be happy, build resilience, feel safe and be well connected.

Matters for consideration	Likely impact
	• Planning priority 14: Preserve and enhance the distinctive characteristics of our centres, towns and villages that make them special and unique, into the future. 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 environmental factors need considering.

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** (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, 201, 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 are 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.

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 4.3.
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.
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	Yes. A dredge and reclamation Fisheries permit will be applied for and attached to this REF document.
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 information that is deemed to be sensitive by the TSC will be redacted from this REF prior to publishing on the TSC website.

Link to information on file:

[redacted]

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	[redacted]
Position	Environmental Scientist
Date	19/7/2022

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	[redacted]

Position	Senior Planning Applications Officer
Date	

Table 9.3: Project client signoff

Project client signoff	
I confirm that: • the REF provides an accurate description of the project scope of works • the mitigation measures proposed within the REF are budgeted for and form part of the final project scope of works.	
Name	[redacted]
Signature	
Position	Senior Program Leader - Waterways
Date	25/7/22

Table 9.4: Project manager signoff

Project manager signoff	
I confirm that: • 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 Environmental Scientist Unit, Environmental Scientist for further assessment (if required).	
Name	[redacted]
Signature	
Position	Project Officer - Waterways
Date	26/7/22

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 two 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**
Flora and fauna	
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**
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**
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**
Branches or trees to be removed should be felled towards cleared areas and away from vegetation to be retained.	**F&F15**
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**
Post-construction	
Areas which are disturbed during construction and not permanently transformed are to be revegetated.	**F&F22**
Erosion and sediment control	
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**
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	
During construction	
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**
Land use and amenity	
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	
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**
Alternate pedestrian access would be provided where works impact upon pedestrian infrastructure such as footpaths or cycleways.	**PA3**
Signage would be utilised along the alignment to direct and inform the public regarding access to and around the site.	**PA4**
Noise and vibration	
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	**N&V8**

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.	
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	
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	
During construction	
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	
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	
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 rain event.	**HAZ8**

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	
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 553601926) and 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**
Waste Minimisation and Management	
During construction	
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: Location of site
(TSC[2], 2022)

Figure 2: Zoning of subject site
TLEP 2014 left; TLEP 2000 right (TSC[2], 2022)

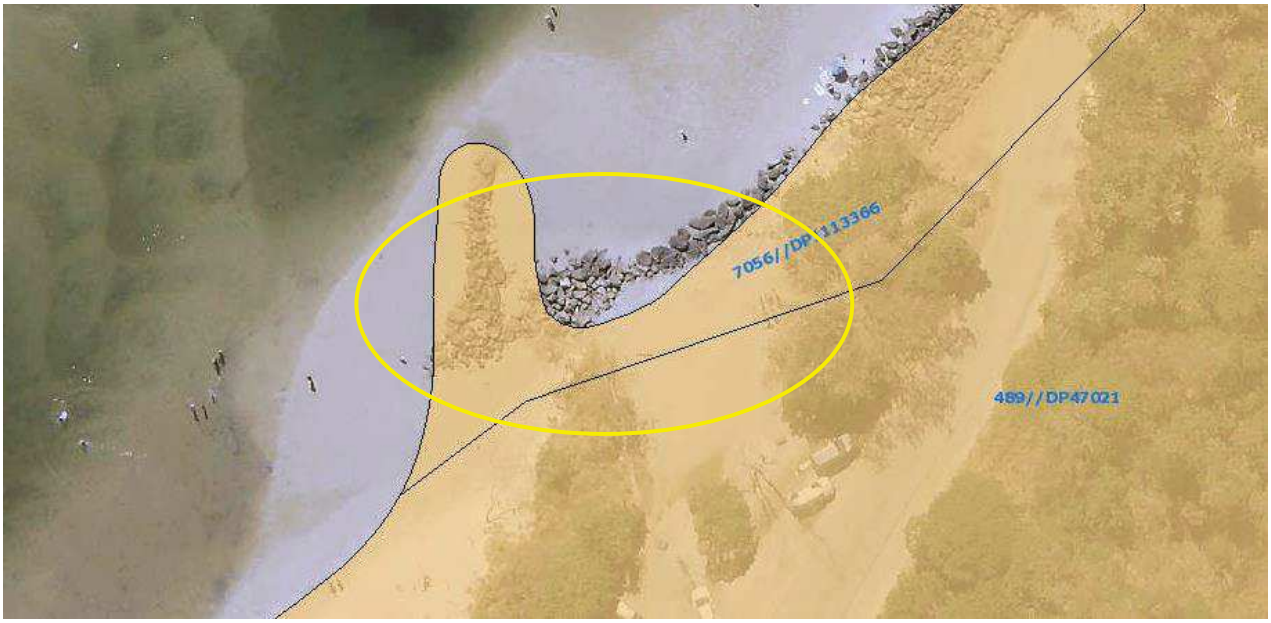

Figure 3: Tenure of subject site
Orange shading = Council managed Crown Land (TSC[2], 2022)

The following figures are historical and current aerial imagery of the subject site. White cross hairs indicate the subject site.

Figure 4: Historical aerial imagery from 1962
(NSW Government, 2022)

Figure 5: Historic aerial imagery from 1972
(NSW Government, 2022)

Figure 6: Historic aerial imagery from 1979
(NSW Government, 2022)

Figure 7: Historic aerial imagery from 1987
(NSW Government, 2022)

Figure 8: Historic aerial imagery from 1991
(NSW Government, 2022)

Figure 9: Historic aerial imagery from 1997
(NSW Government, 2022)

Figure 10: Historic aerial imagery from 2004
(TSC[2], 2022)

Figure 11: Historic aerial imagery from 2015
(TSC[2], 2022)

Figure 12: Current aerial imagery from June 2022
(Nearmap image off TSC[2], 2022)

Plate 1: Subject site showing bank erosion from creek beach looking upstream

Plate 2: Subject site showing bank erosion from creek beach looking downstream

Plate 3: Subject site showing bank erosion from park looking upstream

Plate 4: Subject site showing bank erosion from park beach looking downstream

Plate 5: Concrete platform to be removed

Plate 6: Erosion behind Cottonwoods on downstream end of subject site

12.0 References

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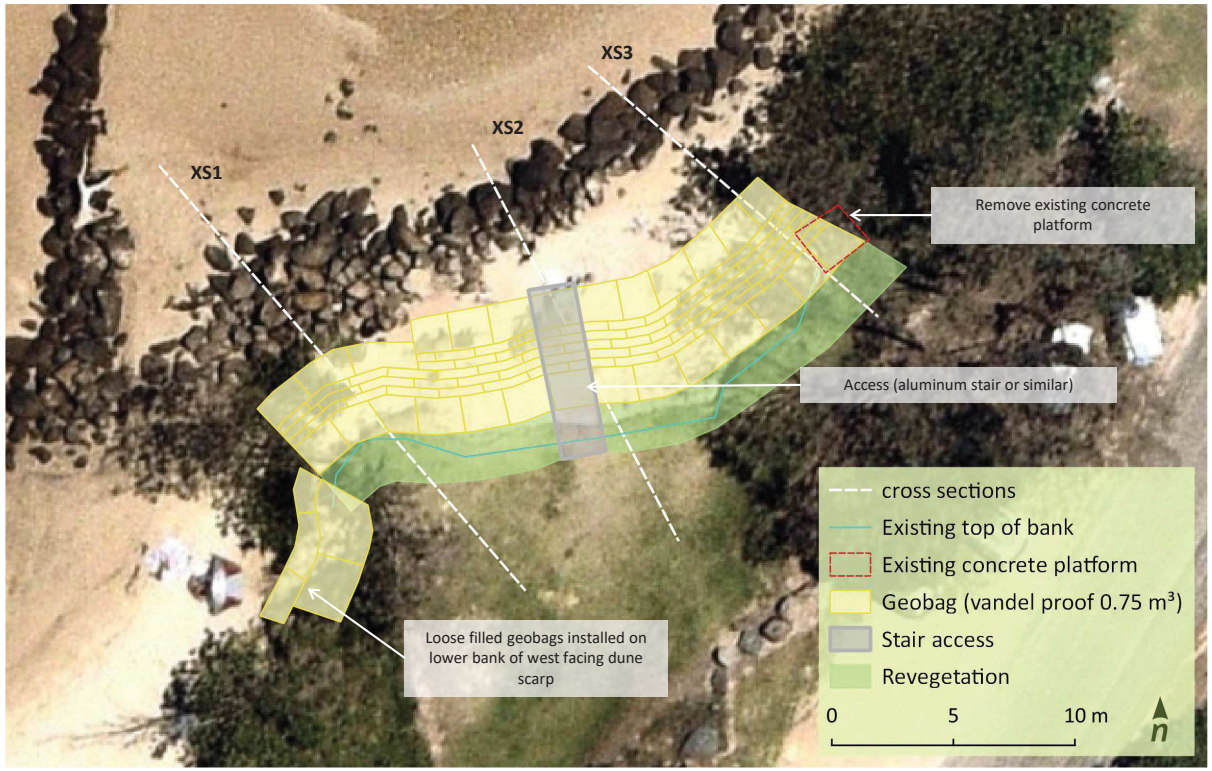
13.0 Appendices

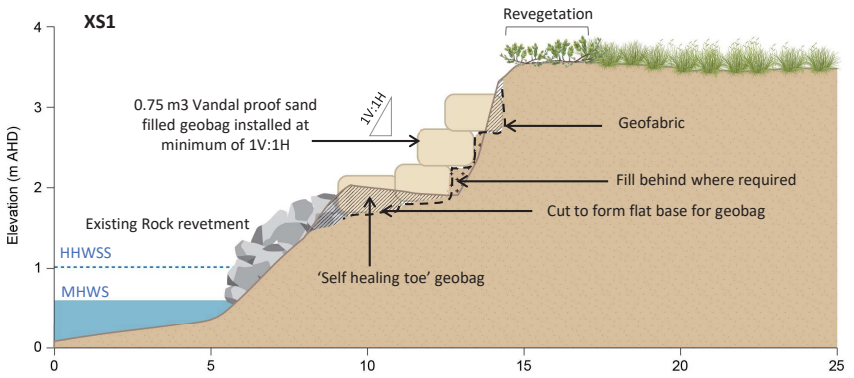
Appendix A Design plans

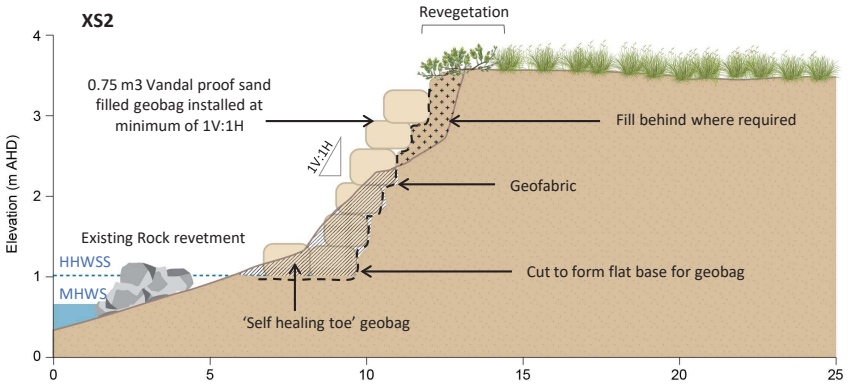
Proposed works overview

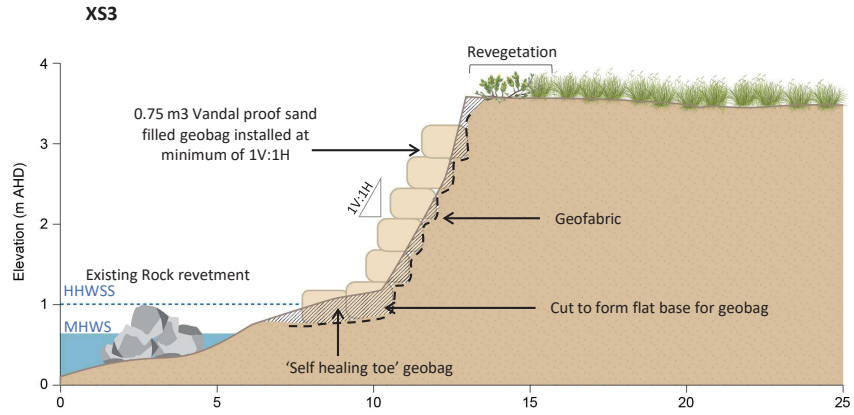
- Removal of existing concrete platform at downstream extent
- Minor earthworks to create base for geotextile sand containers (geobag) revetment
- Installation of screw pile foundations for aluminium access stair (prior to goebag installation)
- Installation of 0.75m³ vandal proof sand filled geobag revetment at a minimum slope of 1V:1H (*Refer to 'ELCOROCK – installation guidelines' for detailed description*)
- Back filling of material where required against layer of geofabric
- Partially filled geobags installed on lower bank of west facing dune scarp to placed against existing bank surface
- Installation of aluminium access stair (following geobag installation)
- Establishment of riparian vegetation along the upper bank and overbank zone (2-3 m)



Typical cross sections of proposed works







HHWSS: High High Water Spring Solstice, **MHWS:** Mean High Water Spring

	NAME	DATE
DESIGNED	J.TEAGUE	02.06.2022
DRAWN	J.TEAGUE	02.06.2022
CHECKED	A.BROOK	02.06.2022
APPROVED	A.BROOK	02.06.2022

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TWEED SHIRE COUNCIL

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CUDGEN CREEK BEACH BANK STABILISATION

Concept design

Sheet: 1	Status: PRELIMINARY ISSUE	Scale: AS SHOWN
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Specification	Units	Value
Length of works	m	25
Approx. number of geotextile sand containers (1.5m by 1.8m)	Item	95
Geofabric	m^2	150
Revegetation area	m^2	50

Geotextile Sand Containers – Material Properties 1200R

Property	Qty	Test Method
Test Thickness	11.5 mm	AS 3706.1-00
Wide Strip Tensile Strength – MD Wide Strip Tensile Strength – XMD	50 kN/m 100 kN/m	AS 3706.2-00
Trapezoidal Tear Strength – MD Trapezoidal Tear Strength – XMD	1400 N 2500 N	AS 3706.3-00
CBR Burst Strength	13,000 N	AS 3706.4-01
Grab Tensile Strength – MD Grab Tensile Strength – XMD	3750 N 6550 N	
Pore Size	< 75 um	AS 3706.7-90
Permittivity	0.38 s-1	AS3706.9-01
Coefficient of Permeability	45.5 x 10-04	AS3706.9-01
Flow Rate @ 100mm Head	38 l/m2/s	AS 3706.9-01
Abrasion	32 kN/m2	BAW Rotating Drum
UV Stability	54.5 kN/m 49.8 kN/m 47.0 kN/m	ASTM D4355-500 hrs ASTM D4355-1000 hrs ASTM D4355-2000 hrs

GENERAL

1. CADASTRAL SURVEY SUPPLIED BY TWEED SHIRE COUNCIL
2. ALL LEVELS ARE IN METRES TO AHD.
3. ALL CONSTRUCTION WORK, MATERIALS, WORKMANSHIP AND WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS INCLUDING AS4997, AS3962, AS3600, AS4100, AS1664, AS1720, AS1170.1, AS1170.2.
4. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMATION OF THE SET-OUT AND ALL ONSITE SET-OUT.
5. ALL LOCATIONS, ORIENTATION AND LEVELS SHALL BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK. DISCREPANCIES SHALL BE REFERRED TO THE SITE SUPERINTENDENT.
6. DO NOT OBTAIN DIMENSIONS FROM SCALING
7. ALUMINIUM STAIR TO BE DESIGNED BY COUNCIL

GEOTEXTILE SAND CONTAINERS

1. GEOTEXTILE SAND CONTAINERS ARE TO BE GEOFABRICS ELCOROCK 0.75m^3 OR SUITABLE APPROVED EQUIVALENTS
2. GEOTEXTILE SAND CONTAINERS ARE TO BE INSTALLED TO MANUFACTURES SPECIFICATIONS
3. GEOTEXTILE SAND CONTAINERS ARE TO BE STAGGERED HORIZONTALLY AND VERTICALLY TO MAXIMISE INTERLOCKING FOR THE SEAWARD LAYER.
4. GEOTEXTILE SAND CONTAINERS ARE TO BE HYDRAULICALLY FILLED AND PLACED USING MANUFACTURES FILLING FRAME AND TO MANUFACTURES SPECIFICATIONS
5. HANDLING EQUIPMENT USED ON SITE SHALL BE ADEQUATE AND NOT POSE ANY RISK OF DAMAGE TO THE GSC AND IN PARTICULAR, THE EDGE SEAM OF THE GSC;
6. GSCS SHALL BE HANDLED WITH CARE. DRAGGING OF THE GSCS OVER ABRASIVE SURFACES WILL NOT BE ALLOWED.
7. GEOTEXTILE SAND CONTAINERS ARE TO BE LAID SO THAT THE FILLING PORTS ARE NOTE EXPOSED
8. CLOSURE OF THE GSC SHALL BE BY THE COMPLEX METHOD. THE COMPLEX CLOSURE IS A DOUBLE CLOSURE, WHICH CONSISTS OF A FILLING TUBE THAT MUST BE ROLLED UP, TIED OFF AND PUSHED INTO THE BODY OF THE GSC.
9. RE-HANDLING OF GEOTEXTILE SAND CONTAINERS TO BE MINIMISED WHERE POSSIBLE
10. GEOTEXTILE UNDERLAY TO BE GEOFABRICS TEXTEL 600R OR SUITABLE APPROVED EQUIVALENT.
11. ENDS OF SEAWALL TO BE TAPERED INTO EXISTING PROFILE
12. SEAWALL CREST IS NOT DESIGNED TO WITHSTAND LOADINGS IN ADDITION TO PEDESTRIAN TRAFFIC

INSTALLATION GUIDELINES

1. PLEAS REFER TO '*GEOFABRICS – ELOROCK 0.75M3 – INSTALLATION GUIDELINES*' OR SUITABLE EQUIVALENT PRODUCT FOR INSTALLATION DETAILS

	NAME	DATE
DESIGNED	J.TEAGUE	24.05.2022
DRAWN	J.TEAGUE	24.05.2022
CHECKED	A.BROOK	24.05.2022
APPROVED	A.BROOK	24.05.2022

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TWEED SHIRE COUNCIL

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CUDGEN CREEK BEACH BANK STABILISATION
Concept design

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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	None.
National Heritage Places	None.
Wetlands of International Significance (RAMSAR Sites)	None.
Great Barrier Reef Marine Park	None.
Commonwealth Marine Areas	One identified: EEZ and Territorial Sea This Commonwealth Marine Area is not present at the subject site and the proposed works would not impact this area.
Listed Threatened Ecological Communities	Five 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 Littoral Rainforest and Coastal Vine Thickets of Eastern Australia Lowland Rainforest of Subtropical Australia Subtropical and Temperate Coastal Saltmarsh These vegetation communities are not mapped as being present at the site. The proposed works have been designed to avoid vegetation clearing and would therefore not impact upon any TECs.
Listed Threatened Species	107 identified. Given the disturbed nature of the site 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	85 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	10 identified: • Commonwealth Land – Australian Telecommunications Commission (11235) NSW • Commonwealth Land – Australian Telecommunications Commission (16008) NSW • Commonwealth Land – Australian Telecommunications Commission (11239) NSW • Commonwealth Land – Australian Telecommunications Commission (11238) NSW • Commonwealth Land – Australian Telecommunications Corporation (11237) NSW • Defence – TS VAMPIRE (10019), NSW • Defence – TS VAMPIRE (10020), NSW • Commonwealth Land – (11234), NSW • Commonwealth Land – (11236), NSW • Commonwealth Land – (15713), NSW The subject site is not with these Commonwealth Lands and the proposed works would not impact these areas.
Commonwealth Heritage Places	None.
Listed Marine Species	114 identified. Given the small proposed disturbance footprint of the proposal and the nature of the proposed activity, marine species are unlikely to be impacted upon.
Whales and Other Cetaceans	15 identified. Given the small proposed disturbance footprint of the proposal and the native or the proposed activity, whales and other cetaceans are unlikely to be impacted upon.
Critical Habitats	None.
Commonwealth Reserves Terrestrial	None.
Australian Marine Parks	None.
Habitat Critical to the Survival of Marine Turtles	None.
State and Territory Reserves	6 identified: • Cook Island Nature Reserve, NSW • Cook Island Aquatic Reserve, NSW • Cudgen Nature Reserve, NSW • Stotts Island Nature Reserve, NSW • Tweed Estuary Nature Reserve, NSW • Ukerebagh Nature Reserve, 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	4 identified: • Cook Island Nature Reserve, NSW • Cudgen Nature Reserve, NSW

Additional matter protected under the EPBC Act	Relevancy to the proposed activity
	• Stotts Island Nature Reserve, NSW • Ukerebagh Island Nature Reserve, NSW The subject site is sufficiently removed from the listed nationally important wetlands and therefore the proposed works will not impact upon them.
EPBC Act Referrals	15 identified. The referrals listed have all completed or post-approval assessment statuses and are all unrelated to the proposed disturbance footprint and proposal.
Key Ecological Features (Marine)	None.
Biologically Important Areas	11 identified. Given the proposal is to reduce erosion and will ultimately improve the localised surrounding environment, the 11 species identified will not be impacted by the proposal.
Bioregional Assessments	None.
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

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 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 and
- 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) and
- 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, soils and
- 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 C.1 as follows:

Table C.1 Desktop assessment results

Attributes	Comments
Vegetation communities	The Tweed Shire Council vegetation mapping identifies 2 vegetation communities as occurring within the disturbance footprint: Substantially Cleared of Vegetation (veg code: 1099) and Not Assessed (veg code: 998). Kingston et al (2004) describes the Substantially Cleared of Vegetation community 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. The Not Assessed vegetation community that is mapped included areas of native vegetation adjacent to the creek. Other vegetation communities within the study area include Post-mining Regeneration (veg code: 1008). **Post-mining regeneration** This community describes extensive areas of the Tweed coastline which were sand mined between the 1950s to the 1970s and subsequently replanted with a mixture of local and non-endemic species (Kingston, 2004). Species typically includes wattles, she-oaks, banksias and tea-trees (*Leptospermum* spp.) (Kingston, 2004). Refer to Figure C.1.
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 51 threatened flora species were short-listed from these searches. Of these 51 short-listed threatened flora species, a likelihood of occurrence assessment concluded none were likely to occur within the study area.
Corridor mapping	The subject site is mapped as being within a regional corridor which extends along the coastline of the Tweed, starting at Fingal Head Peninsula and extending south to Mooball. This corridor connects areas of core habitat, namely Fingal Head peninsula, Ukerebagh Nature Reserve, Kings Forest, Cudgen Nature Reserve, Pottsville Environment Park and Pottsville wetlands. Several east-west corridors branch off from this coastal corridor connecting with other National Park and Nature Reserves throughout the Tweed.
Osprey nests	None present within the disturbance footprint. The nearest mapped Osprey nest is located [redacted]
Flying-fox camp	The nearest flying-fox colony is located approximately [redacted]
Marine vegetation	Extensive areas of marine vegetation such as mangrove forest, saltmarsh and seagrass occur throughout the estuarine shallows within the broader study area. However, no marine vegetation occurs within the proposed disturbance footprint.
Koala habitat	No Koala habitat is mapped within the Kingscliff back beach peninsula. Small patches of Koala habitat are mapped throughout Kingscliff. The closest patches being associated with the banksia dry sclerophyll forest and paperbark forest in Cudgen Foreshore Park (~1.04 km south-west of the disturbance footprint). The most recent koala records are from 2006.

Attributes	Comments
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 115 threatened fauna species and four populations were short-listed from these searches (pelagic species were immediately dismissed on account of the absence of such habitat in the study area). Of these 115 short-listed threatened fauna species, 14 species were considered likely to occur in the study area including: • [redacted] None of the short-listed populations (Koala x 2, Grey nurse shark, spotted-tail quoll and potoroo) were considered likely to occur within the study area.

Figure C.1 Tweed Shire Council vegetation mapping, proposed subject site in pink

Field assessment methodology

A preliminary diurnal field assessment was undertaken on 8 March 2022. 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 the occasional trees and shrubs occurring as amenity trees and riparian vegetation. A single Horsetail she-oak (*Casuarina equisetifolia*) is present on top of the bank within the disturbance footprint. Tree stumps are present on the beach presumably having fallen from the erosion of the banks and had died. On the downstream end of the disturbance footprint, Cottonwoods (*Hibiscus tiliaceus*) are present growing at the beach level. Some erosion has occurred behind the Cottonwoods. Mown exotic grasses make up the remainder of the vegetation within the disturbance footprint.

Of the 51 short-listed threatened flora species, a likelihood of occurrence assessment concluded none were likely to occur within the study area. No threatened species were identified during the field survey.

Overall, the vegetation within the disturbance footprint is reflective of the historic clearing and sand mining disturbances and ongoing land management activities that has occurred as its use as a coastal foreshore park (e.g. regular mowing to remove understorey regeneration). 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.

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, Cudgen Creek, its beaches and the surrounding beaches of Kingscliff offers marine communities including mangrove forest, saltmarsh, seagrass beds, sandy dunes and minimally trafficked sandy beaches, and regenerating forests. Diurnal field investigations did not record any threatened species at the site.

An assessment of specific habitat attributes within the study area is provided in Table C.2 below.

Table C.2 Fauna habitat attributes associated with the subject site

Fauna habitat attributes	Comments
Rock features including cracks, sheets, shelters, outcrops	None observed within the disturbance footprint. There is rock revetment adjacent to the subject site and is present on both sides of Cudgen Creek downstream of the subject site all the way to the creek mouth.
Autumn - winter - early spring flowering eucalypts	None observed within the subject site area. Present within the broader study area.
Summer flowering eucalypts	None observed within the subject site. Present within the broader study area.
Acacia shrubs-trees	None observed within the subject site. Coastal wattle (*Acacia longifolia* subsp. *sophorae*) is present within the post-mining regeneration (foredune community). Other wattles are present within the broader study area.
Other flowering and fruiting resources	Present within the subject site are native species such as Horsetail she-oak and Cottonwoods. The study area has native species such as Coast banksia (*Banksia integrifolia*), Tuckeroo (*Cupaniopsis anacardioides*), Macaranga (*Macaranga tanarius*) and Pandanus (*Pandanus tectorius*) which provide blossom and fruit resources.
Allocasuarina resources for Glossy Black Cockatoos	None observed within the subject site, however *Allocasuarina* species are present 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 subject site and study area (e.g. parkland). 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 park shelters, residential houses and other buildings provide potential micro-bat roosting habitat in the form of roof cavities. The Sutherland Street bridge and raised walkway on the western side of Cudgen Creek may provide some roost potential, although these may be quite exposed to noise disturbance and therefore suboptimal. Native vegetation throughout the Kingscliff foreshore areas provides tree roosting opportunities for micro-bats.
Ephemeral water bodies	None observed within the study area.
Permanent water bodies	Cudgen Creek occurs adjacent to the subject site and the Coral Sea occurs beyond the foreshore to the east.
Drainage lines and / or soaks and / or man-made water bodies	None observed within the study area.
Understorey cover for ground dwelling mammals	None observed within the subject site. Some shrubs and groundcover vegetation within the post-mining regeneration (foredune community) within the study area offers cover to ground dwelling mammals such as rodents.
Fallen fine and coarse vegetative litter	Some leaf litter is provided within the post-mining regeneration (foredune community) in the study area, however, this resource was generally scarce within the subject site on account of the regular mowing regime the park is subjected to.
Hollows in live and / dead trees	None observed within the study area.
Marine Vegetation	None observed within the subject site. Is present within the study area within the bed and banks of Cudgen Creek. Marine vegetation present in the broader study area includes seagrass, mangroves and saltmarsh.
Riparian vegetation	Cottonwoods are riparian vegetation and are present within the subject site. Riparian vegetation also occurs as estuarine vegetation communities in the broader study area.

Fauna habitat attributes	Comments
Flying-fox camps	The nearest flying-fox colony [redacted] and is sufficiently removed form the subject site.
Osprey and/or other raptor nests	None present within the subject site. The nearest [redacted]
Exposed coastal fore dunes and beaches	Yes - occurs extensively in the surrounding area, along the foreshore to the east of the disturbance footprint, extending north and south along the Tweed coastline.
Oceanic habitats	Yes – occurs extensively in the Coral Sea to the east.
Areas of Outstanding Biodiversity Value pursuant to NSW legislation	None present within the study area. [redacted]

Impact assessment

Flora

The proposed bank stabilisation upgrade has been designed to avoid and to minimise disturbance of tree roots. Despite these efforts, the location of the Horsetail she-oak and Cottonwoods in relation to the extent of the bank erosion and requirement within which to construct the revetment has necessitated some works within their Tree Protection Zones (TPZ). Based on the proposed works it is estimated that 2 native trees and shrubs are at risk of harm due to root damage during works, and may need to be removed if it is deemed unlikely that they will survive and not pose a risk to the safety of the public. The impact of the root damage on the short and long-term health of these trees is difficult to predict and impact has already occurred via root exposure due to bank erosion. All trees for which disturbance would encroach more than 10% of the TPZ are considered at risk of harm and potential death. Impacted trees and shrubs include: 1 mature Horsetail she-oak and one Cottonwood.

As part of the design for the stabilisation of the banks, revegetation will occur at the top of the bank. This revegetation will include native species that are locally-occurring and will help to not only provide long-term bank stabilisation, but to also provide and enhance habitat within the localised area.

Fauna

As previously discussed, the habitat values within the broader study area are significant due to the diverse mosaic of coastal ecological communities present. However, the habitat values within the disturbance footprint itself are limited on account of the absence of native vegetation communities and the disturbance (mowing regime). The proposed works are relatively low impact.

As previously stated, the likelihood of occurrence (LOC) assessment concluded that 14 threatened fauna species were likely to occur in the study area, including:

- [redacted]

- [redacted]

None of the short-listed populations (Koala x 2, Grey nurse shark, spotted-tail quoll and potoroo) were considered likely to occur within the study area.

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. [redacted] From the available records, a [redacted] Given the breeding site-fidelity exhibited by this species, they are unlikely to use the habitat within the disturbance footprint for breeding in the short to medium term. They may pass through the site on occasion to forage for food although are more likely to be attracted to the native vegetation to the east of the subject site where cover is present. [redacted] are all fish eaters and so foraging within the study area would be limited to Cudgen Creek and the open ocean. They may temporarily perch within the study area as they move through the landscape.

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, mostly cleared nature of the disturbance footprint, the limited habitat features, the small extent of potential vegetation disturbance proposed, and the proposed design to protect the creek beaches and their extents; 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 negligible 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. High conservation values exist within the surrounding area (e.g. within the native vegetation communities throughout the Kingscliff coastal areas and the adjoining estuarine and marine habitats). However, the proposed works are unlikely to impact upon these habitats. 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.

Appendix D Preliminary Aboriginal Cultural Heritage Plan

TWEED SHIRE COUNCIL

Preliminary Aboriginal Cultural Heritage Assessment (PACHA)

Cudgen Creek beach bank stabilisation, Robert Dixon Park, Kingscliff

July 2022

Version	Title	Date
1.0	Preliminary Aboriginal Cultural Heritage Assessment (PACHA)	20/7/2022

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 Environment and Planning, 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 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)	☐ Yes ☒ No

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)	[redacted]

Desktop resource reviewed	Response
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
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? (eg. 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) Historically disturbed due to sand mining operations and construction of rock revetment for creek mouth manipulation.

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?	☐ Yes (stakeholder consultation is required, see below) ☒ No (specify why and then proceed to Section 8) Justification: Considerable earthworks occurred during the historical sand mining operations. Earthworks also occurred during the manipulation of the Cudgen Creek mouth entrance and the construction of rock revetment. Given the extent of earthworks previously undertaken at the site, the likelihood of encountering ACH objects is considered low.
Stakeholders consulted	☐ TBLALC ☐ AAC ☐ OEH Archaeologist ☐ Consultant Archaeologist ☒ N/A
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

Consultation outcomes	Response
Did representatives request any project-specific mitigation measures?	☐ Yes (list recommendcations) _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ ☐ 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?	[redacted]
Can harm to Aboriginal places and objects be avoided?	☒ Yes ☐ No ☐ Uncertain
Are site monitors required during construction?	☐ Yes ☒ No
Is an ACHAR and AHIP required?	☐ Yes. Engage a consultant Archaeologist to undertake ACHA and, if deemed necessary, apply for an AHIP. Refer to OEH Guidelines. ☒ No. The project is to proceed with caution. If any potential Aboriginal objects are found, work is to stop and the stop works procedure provided in the ACHMP – Appendix 7 is to be applied. N.B. If human remains are found, work is to stop, the site secured and the NSW Police notified. All staff and contractors on site are to be notified that it is an offence under the Coroners Act to interfere with the materials/remains.

9.0 Figures and plates

Figure 1. Aerial photograph showing study area

[redacted]

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.

TWEED
SHIRE COUNCIL

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Appendix E Waste Management Plan

TWEED SHIRE COUNCIL

Cudgen Creek beach bank stabilisation, Robert Dixon Park, Kingscliff

Waste Management Plan

July 2022

Revision history

Version	Title	Date
1.0	Waste Management Plan – Cudgen Creek Beach Bank Stabilisation, Robert Dixon Park, Kingscliff	20/7/2022

Introduction

The following pre-classification of waste streams to be generated during the construction of the proposed bank stabilisation are based on the following:

- review of the preliminary site contamination investigation
- communication with Council Environmental Scientist 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.

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
Concrete	Discarded concrete platform.	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	$52.00
General construction waste	Geofabric material, sediment fencing etc.	General solid waste (non-putrescible) - Building and demolition waste	Re-use 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 E1

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).

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Appendix F Fisheries Permit

NSW GOVERNMENT | Department of Primary Industries

OUR REF: PN22/324

12 August 2022

The General Manager
Tweed Shire Council
PO Box 816
MURWILLUMBAH NSW 2484
Via email: [redacted]

[redacted]

[redacted]

Re: Permit # PN22/324 for dredging and reclamation work associated with bank stabilisation works within Cudgen Creek, adjacent to Lot 7056 DP 1113366 and Lot 489 DP47021, Cudgen Headland, Kingscliff, Tweed LGA

I refer to your application dated 29 July 2022 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 bank stabilisation works within Cudgen Creek, adjacent to Lot 7056 DP 1113366 and Lot 489 DP47021, Cudgen Headland, Kingscliff, Tweed 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 owner consents before works occur. This may include, but is not restricted to, development consent under the *Environmental Planning & Assessment Act 1979*, land owners consent and/or a 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. <u>If you believe that you cannot comply with all the conditions then you must not commence work.</u>** 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 adjacent waters. We expect implementation of Best Management Practice with respect to erosion and sediment control and 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 (https://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 [redacted], Fisheries Manager, Coastal Systems (North Coast) on [redacted]

Yours sincerely

[redacted]

Senior Fisheries Manager, Coastal Systems (North Coast)
Authorised delegate of the Minister for Primary Industries

Cc: [redacted] **Tweed District Fisheries Officer**
Fisheries Conservation Compliance Officer

NSW GOVERNMENT | Department of Primary Industries

Permit under Part 7 of the

FISHERIES MANAGEMENT ACT 1994

Permit	Permit Number	**PN22/324**
	Expiry Date	Unless cancelled or suspended sooner, this permit or updated variations shall remain in force until **1 September 2023**
Permit Holder:	Tweed Shire Council PO Box 816 MURWILLUMBAH NSW 2484 **Responsible Officer:** [redacted] Phone: [redacted] Email: [redacted]	
Permit Area:	Within the Cudgen Creek, adjacent to Lot 7056 DP 1113366 and Lot 489 DP47021, Cudgen Headland, Kingscliff, Tweed LGA **(Refer to Attachment 1)**	
Permit Activity:	Dredging and reclamation works, specifically: - Removal of a redundant concrete platform; - Minor reshaping of the riverbank to allow for the installation of 95 geotextile sand containers as a new 1:1 revetment wall (approx. 25m long by 1-4m high – 0.75m³); - Backfilling behind the new revetment wall with excess sand collected from reshaping the bank; and - Installation of new aluminium stairs on screw pile foundations. Associated with bank stabilisation works as proposed in your application of 29 July 2022 **(Refer to Attachment 2)**	
Departmental Contact Officer:	[redacted] Fisheries Manager, Coastal Systems (North Coast) 1243 Bruxner Hwy WOLLONGBAR NSW 2477 Ph: [redacted] Email: [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** the District Fisheries Officer at Tweed (Phone: [redacted] 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 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 29 July 2022. In particular, all the actions and recommendations outlined in Tweed Shire Council's document titled *Review of Environmental Factors, Cudgen Creek beach bank stabilisation, Robert Dixon Park, Kingscliff* dated July 2022 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.

4. This permit (or a true copy), a copy of the determined Construction Environmental Management Plan (CEMP) and other relevant approvals 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

5. Erosion and sediment mitigation devices are to be erected in a manner consistent with the 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 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

6. 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 including construction of rock armouring authorised by this permit.
Reason – To ensure minimal risk of water pollution from oil or petroleum products and to minimise disturbance to the streambed substrate.

7. Only clean material 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.

8. Geotextile fabric is to be used to underlay the geotextile sand containers 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.

9. 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.

10. 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]. 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 AND LOW TIDES

11. Works are to be undertaken during low flows in Cudgen Creek and when Bureau of Metrological 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.

12. Instream works should be undertaken during neap tides only as this facilitates the most effective use of silt curtains.
Reason – Timing the works for appropriate conditions can reduce delays and minimise impacts on the aquatic environments.

AVOIDING MOVING OR HARMING SNAGS, AND RIPARIAN VEGETATION

13. When working near riparian vegetation on water land[2], these areas are to be identified and appropriately delineated as “No Go” areas (with the aim of avoiding harm to these areas). Removing, moving or harming 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 vegetation is to be documented and reported to the contact officer who may direct that the removed, harmed or damaged vegetation on water land be restored.
Reason – To ensure that impacts on aquatic habitats and the riparian zone are minimised.

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[1] Available at: www.environment.nsw.gov.au/resources/water/BlueBookVol1.pdf

[2] “***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.

14. Material storage and stockpiling is not to be undertaken on water land, or riparian vegetation. Stockpiling must be undertaken in a manner to avoid harm to these types of vegetation or water land. Stockpiles should also be located 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.

15. No snags[3] 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.

16. 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;
- Removal of all excess material excavated as part of the bank reshaping that is not to be reused as fill behind the new revetment wall;
- Complete removal of the concrete platform;
- Undertaking plantings as proposed in the REF;
- Appropriate maintenance of erosion and sediment control devices until the vegetation has successfully established and the site has stabilised.
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.

FISH KILL CONTINGENCY

17. 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.

[3] "***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).

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)
Authorised delegate of the Minister for Primary Industries

12 August 2022

Attachment 1

Figure 1: Plan showing location of works as described within the *Permit Area* section above.

Attachment 2

Figure 1: Plan showing final design of bank stabilisation works as described within the *Permit Activity* section above.

Acceptance of Conditions Form specified in Permit No. PN22/324 issued under Part 7 of the *Fisheries Management Act 1994*

PLEASE COPY THIS PAGE AND RETURN TO DPI FISHERIES

In reference to Permit No. PN22/324 for dredging and reclamation work associated with bank stabilisation works within Cudgen Creek, adjacent to Lot 7056 DP 1113366 and Lot 489 DP47021, Cudgen Headland, Kingscliff, Tweed LGA:

I the undersigned, acknowledge that I have read and understood and agree to comply with the conditions specified. I understand that penalties can be imposed for non-compliance with conditions.

Permit Holder's name: _____

Permit Holder's signature: _____

Date: _____

Please COPY AND SIGN this page and email to:

ahp.central@dpi.nsw.gov.au

Division of Primary Industries, DPI Fisheries
1243 Bruxner Hwy, WOLLONGBAR NSW 2477
Tel: 02 6626 1395 ABN 19 948 325 463 www.dpi.nsw.gov.au

NSW GOVERNMENT | Department of Primary Industries

Commence Works Notification Form specified in Permit No. PN22/324 issued under Part 7 of the *Fisheries Management Act 1994*

PLEASE COPY THIS PAGE AND RETURN TO DPI FISHERIES

In reference to Permit No. PN22/324 for dredging and reclamation work associated with bank stabilisation works within Cudgen Creek, adjacent to Lot 7056 DP 1113366 and Lot 489 DP47021, Cudgen Headland, Kingscliff, Tweed LGA:

Commence Works Notification Form

(Note: to be completed and returned 3 days before commencement of works)

Permit Holder's Name: _____

Site Location: _____

Works _____

Commencement Date: _____

Comments:

Project Manager:_____Date:_____

Please COPY AND SIGN this page and email to:

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robert.loring@dpi.nsw.gov.au
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