16 June 2017

Attention Manager Sustainable Communities
Douglas Shire Council
PO Box 723
MOSSMAN QLD 4873

Our ref: 4219890-58658
Your ref:

Dear Sir/Madam

Mossman Wastewater Treatment Plant River Bank Stabilisation
Prescribed Tidal Works Development Application

We act on behalf of Douglas Shire Council and have been instructed by our client to make application for an operational works development permit for prescribed tidal works proposed for the riverbank protection works associated with the Mossman Wastewater Treatment Plant (MWTP). The application is for the construction of a revetment wall along the west side of the MWTP within the Mossman River; and a revetment wall along the east side of the MWTP within the South Mossman River.

Riverbanks adjacent to the MWTP have been subject to ongoing instability and slope failures in recent years. During and following significant rainfall events, slip scarps have encroached upon site boundary fences and buried services. Future progression of observed bank instability may place key WWTP structures at risk of serviceability loss or structural failure. Therefore, revetment wall designs have been progressed.

The prescribed tidal works are assessable development under Schedule 3, Part 1, Table 4, Item 5(a) and 5(b) of the *Sustainable Planning Regulation 2009* which identifies that tidal works constitute code assessable operational works for tidal works and for works within a coastal management district interfering with quarry material on State coastal land above high-water mark. Item 1(b) of Table 1 in Schedule 6 of the *Sustainable Planning Regulation 2009* identifies that the assessment manager for the application is Douglas Shire Council however Schedule 7 and Table 2, Item 15 and Schedule 7, Table 2, Item 29 of the *Sustainable Planning Regulation 2009* detail that referral to the Chief Executive of the agency responsible for the implementation of the *Sustainable Planning Act 2009* will be required.

In this regard, referral to the State Assessment and Referral Agency will be required as a concurrence agency for the nominated referral triggers.

Please find enclosed the following information to assist in consideration of this application:

- Completed IDAS Forms 1, 23 and 27
- Land owners consent (in the process of being finalised)
- Supporting documentation addressing the following for prescribed tidal works and waterway barrier works:
  - Module 10 sand Module 5.2 of the State Development Assessment Provisions
- Design drawings.

GHD Pty Ltd ABN 39 008 488 373
1st Floor 85 Spence Street Cairns QLD 4870 PO Box 819 Cairns QLD 4870 Australia
T 61 7 4044 2222 **F** 61 7 4044 2288 **E** cnsmail@ghd.com **W** www.ghd.com

Upon receipt of this application, please contact Scott Hahne (Douglas Shire Council Project Engineer) to confirm arrangements for Council's development application fee. Joel can be contacted via phone on 07 4099 9415 or email Scott.Hahne@douglas.qld.gov.au.

Should you have any enquiries or require any additional information in relation to this matter please contact the undersigned (email kylie.cauchi@ghd.com) or Andrew Small on 07 4044 2206 (email andrew.small@ghd.com).

Sincerely
GHD Pty Ltd

pp

Kylie Cauchi
Senior Environmental Scientist
+61 7 4044 2209

IDAS form 1—Application details

(*Sustainable Planning Act 2009* version 4.3 effective 5 December 2016)

This form must be used for **ALL** development applications.

You **MUST** complete **ALL** questions that are stated to be a mandatory requirement unless otherwise identified on this form.

For all development applications, you must:

- complete this form (*IDAS form 1—Application details)*
- complete any other forms relevant to your application
- provide any mandatory supporting information identified on the forms as being required to accompany your application.

Attach extra pages if there is insufficient space on this form.

All terms used on this form have the meaning given in the *Sustainable Planning Act 2009* (SPA) or the Sustainable Planning Regulation 2009.

This form and any other IDAS form relevant to your application must be used for development applications relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994* and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*. Whenever a planning scheme is mentioned, take it to mean land use plan for the strategic port land, Brisbane core port land or airport land.

PLEASE NOTE: This form is not required to accompany requests for compliance assessment.

Mandatory requirements

Applicant details (Note: the applicant is the person responsible for making the application and need not be the owner of the land. The applicant is responsible for ensuring the information provided on all IDAS application forms is correct. Any development permit or preliminary approval that may be issued as a consequence of this application will be issued to the applicant.)

Name/s (individual or company name in full)	**Douglas Shire Council**			
For companies, contact name	**C/o – Kylie Cauchi**			
Postal address	PO Box 819			
	Suburb	Cairns		
	State	Queensland	Postcode	4870
	Country	Australia		
Contact phone number	07 4022 2209			
Mobile number (non-mandatory requirement)				
Fax number (non-mandatory requirement)				

Email address (non-mandatory requirement)	Kylie.Cauchi@ghd.com
Applicant's reference number (non-mandatory requirement)	

1. What is the nature of the development proposed and what type of approval is being sought?

Table A—Aspect 1 of the application (If there are additional aspects to the application please list in Table B—Aspect 2.)

a) What is the nature of the development? (Please only tick one box.)

☐ Material change of use ☐ Reconfiguring a lot ☐ Building work ☒ Operational work

b) What is the approval type? (Please only tick one box.)

☐ Preliminary approval under s241 of SPA ☐ Preliminary approval under s241 and s242 of SPA ☒ Development permit

c) Provide a brief description of the proposal, including use definition and number of buildings or structures where applicable (e.g. six unit apartment building defined as a *multi-unit dwelling*, 30 lot residential subdivision etc.)

The river banks of the Mossman River on the northern boundary of the Mossman Wastewater Treatment Plant (MWTP) and the South Mossman River on the southern boundary of the MWTP have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. During and following significant rainfall events, slip scarps have been encroaching site boundary fences and buried services. Future progression of observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure.

Approximately 78 m of embankment on the South Mossman River and 75 m of embankment on the Mossman River systems are required to be reconstructed utilising geotech fabric and rockfill.

d) What is the level of assessment? (Please only tick one box.)

☐ Impact assessment ☒ Code assessment

Table B—Aspect 2 of the application (If there are additional aspects to the application please list in Table C—Additional aspects of the application.)

a) What is the nature of development? (Please only tick one box.)

☐ Material change of use ☐ Reconfiguring a lot ☐ Building work ☐ Operational work

b) What is the approval type? (Please only tick one box.)

☐ Preliminary approval under s241 of SPA ☐ Preliminary approval under s241 and s242 of SPA ☐ Development permit

c) Provide a brief description of the proposal, including use definition and number of buildings or structures where applicable (e.g. six unit apartment building defined as a *multi-unit dwelling*, 30 lot residential subdivision etc.)

d) What is the level of assessment?

☐ Impact assessment ☐ Code assessment

Table C—Additional aspects of the application (If there are additional aspects to the application please list in a separate table on an extra page and attach to this form.)

☐ Refer attached schedule ☒ Not required

2. Location of the premises (Complete Table D and/or Table E as applicable. Identify each lot in a separate row.)

Table D—Street address and lot on plan for the premises or street address and lot on plan for the land adjoining or adjacent to the premises (Note: this table is to be used for applications involving taking or interfering with water.) (Attach a separate schedule if there is insufficient space in this table.)

☐ Street address **and** lot on plan (All lots must be listed.)

☒ Street address **and** lot on plan for the land adjoining or adjacent to the premises (Appropriate for development in water but adjoining or adjacent to land, e.g. jetty, pontoon. All lots must be listed.)

Street address					**Lot on plan description**		**Local government area** (e.g. Logan, Cairns)
Lot	Unit no.	Street no.	Street name and official suburb/ locality name	Post-code	Lot no.	Plan type and plan no.	
i)			Junction Rd Reserve	4873			Douglas Shire Council
ii)			South Mossman River Esplanade	4873			Douglas Shire Council
iii)					24	RP800895	Douglas Shire Council
iv)					26	RP804231	Douglas Shire Council
v)					22	RP800895	Douglas Shire Council

Planning scheme details (If the premises involves multiple zones, clearly identify the relevant zone/s for each lot in a separate row in the below table. Non-mandatory)

Lot	Applicable zone / precinct	Applicable local plan / precinct	Applicable overlay/s
i)	Road reserve	Mossman and Environs	Acid sulfate soil
ii)	Community and recreational	Mossman and Environs	Acid sulfate soil
iii)	conservation	Mossman and Environs	Acid sulfate soil

Table E—Premises coordinates (Appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay.) (Attach a separate schedule if there is insufficient space in this table.)

Coordinates (Note: place each set of coordinates in a separate row)				**Zone reference**	**Datum**	**Local government area (if applicable)**
Easting	Northing	Latitude	Longitude			
E326818	N9190504	16°27'05"	145°22'37''	MGA Zone 55	☒ GDA94 ☐ WGS84 ☐ other	Douglas Shire Council

3. Total area of land on which the development is proposed (indicate square metres)

2,230 m^2 on South Mossman River (revetment works disturbance area – max 93 m in length and 25 m in width)
1,820 m^2 on Mossman River (revetment works disturbance area – max 95 m in length and 22 m in width)

4. Current use/s of the premises (e.g. vacant land, house, apartment building, cane farm etc.)

Vacant Land.
Road Reserve and River Esplanade along Junction Road adjacent to Mossman Water Treatment Plant.

5. Are there any current approvals (e.g. a preliminary approval) associated with this application? (Non-mandatory requirement)

☒ No ☐ Yes—provide details below

List of approval reference/s	Date approved (dd/mm/yy)	Date approval lapses (dd/mm/yy)

6. Is owner's consent required for this application? (Refer to notes at the end of this form for more information.)

☐ No

☒ Yes—complete either Table F, Table G or Table H as applicable

Table F	
Name of owner/s of the land	
I/We, the above-mentioned owner/s of the land, consent to the making of this application.	
Signature of owner/s of the land	
Date	

Table G	
Name of owner/s of the land	**Department of Natural Resources and Mines**
☒ The owner's written consent is attached or will be provided separately to the assessment manager.	

Table H	
Name of owner/s of the land	
☐ By making this application, I, the applicant, declare that the owner has given written consent to the making of the application.	

7. Identify if any of the following apply to the premises (Tick applicable box/es.)

☒ Adjacent to a water body, watercourse or aquifer (e.g. creek, river, lake, canal)—complete Table I

☐ On strategic port land under the *Transport Infrastructure Act 1994*—complete Table J

☐ In a tidal water area—complete Table K

☐ On Brisbane core port land under the *Transport Infrastructure Act 1994* (No table requires completion.)

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008* (no table requires completion)

☐ Listed on either the Contaminated Land Register (CLR) or the Environmental Management Register (EMR) under the *Environmental Protection Act 1994* (no table requires completion)

Table I
Name of water body, watercourse or aquifer
Mossman River and South Mossman River.

Table J	
Lot on plan description for strategic port land	Port authority for the lot

Table K	
Name of local government for the tidal area (if applicable)	Port authority for the tidal area (if applicable)
Douglas Shire Council	

8. Are there any existing easements on the premises? (e.g. for vehicular access, electricity, overland flow, water etc)

☒ No ☐ Yes—ensure the type, location and dimension of each easement is included in the plans submitted

9. Does the proposal include new building work or operational work on the premises? (Including any services)

☐ No ☒ Yes—ensure the nature, location and dimension of proposed works are included in plans submitted

10. Is the payment of a portable long service leave levy applicable to this application? (Refer to notes at the end of this form for more information.)

☐ No—go to question 11 ☒ Yes

10a. Has the portable long service leave levy been paid? (Refer to notes at the end of this form for more information.)

☒ No

☐ Yes—complete Table L and submit, with this application, the local government/private certifier's copy of the accepted QLeave form

Table L		
Amount paid	Date paid (dd/mm/yy)	QLeave project number (6 digit number starting with A, B, E, L, P or S)

11. Has the local government agreed to apply a superseded planning scheme to this application under section 96 of the *Sustainable Planning Act 2009*?

☒ No

☐ Yes—please provide details below

Name of local government	Date of written notice given by local government (dd/mm/yy)	Reference number of written notice given by local government (if applicable)

12. List below all of the forms and supporting information that accompany this application (Include all IDAS forms, checklists, mandatory supporting information etc. that will be submitted as part of this application)

Description of attachment or title of attachment	Method of lodgement to assessment manager
IDAS Form 1, Form 23 and Form 27	Online / within Supporting Document
Douglas Shire Council MWTP Environmental Approvals Supporting Report.	Online
Douglas Shire Council MWTP Remedial Works EMP	Online / within Supporting Document
Detailed Design Drawings	Online / within Supporting Document

13. Applicant's declaration

☒ By making this application, I declare that all information in this application is true and correct (Note: it is unlawful to provide false or misleading information)

Notes for completing this form

- Section 261 of the *Sustainable Planning Act 2009* prescribes when an application is a properly-made application. Note, the assessment manager has discretion to accept an application as properly made despite any non-compliance with the requirement to provide mandatory supporting information under section 260(1)(c) of the *Sustainable Planning Act 2009*

Applicant details

- Where the applicant is not a natural person, ensure the applicant entity is a real legal entity.

Question 1

- Schedule 3 of the Sustainable Planning Regulation 2009 identifies assessable development and the type of assessment. Where schedule 3 identifies assessable development as "various aspects of development" the applicant must identify each aspect of the development on Tables A, B and C respectively and as required.

Question 6

- Section 263 of the *Sustainable Planning Act 2009* sets out when the consent of the owner of the land is required for an application. Section 260(1)(e) of the *Sustainable Planning Act 2009* provides that if the owner's consent is required under section 263, then an application must contain, or be accompanied by, the written consent of the owner, or include a declaration by the applicant that the owner has given written consent to the making of the application. If a development application relates to a state resource, the application is not required to be supported by evidence of an allocation or entitlement to a state resource. However, where the state is the owner of the subject land, the written consent of the state, as landowner, may be required. Allocation or entitlement to the state resource is a separate process and will need to be obtained before development commences.

Question 7

- If the premises is listed on either the Contaminated Land Register (CLR) or the Environmental Management Register (EMR) under the *Environmental Protection Act 1994* it may be necessary to seek compliance assessment. Schedule 18 of the Sustainable Planning Regulation 2009 identifies where compliance assessment is required.

Question 10

- The *Building and Construction Industry (Portable Long Service Leave) Act 1991* prescribes when the portable long service leave levy is payable.
- The portable long service leave levy amount and other prescribed percentages and rates for calculating the levy are prescribed in the Building and Construction Industry (Portable Long Service Leave) Regulation 2013.

Question 10a

- The portable long service leave levy need not be paid when the application is made, but the *Building and Construction Industry (Portable Long Service Leave) Act 1991* requires the levy to be paid before a development permit is issued.
- Building and construction industry notification and payment forms can be completed on the QLeave website at www.qleave.qld.gov.au. For further information contact QLeave on 1800 803 481.

Privacy—The information collected in this form will be used by the Department of Infrastructure, Local Government and Planning (DILGP), assessment manager, referral agency and/or building certifier in accordance with the processing and assessment of your application. Your personal details should not be disclosed for a purpose outside of the IDAS process or the provisions about public access to planning and development information in the *Sustainable Planning Act 2009*, except where required by legislation (including the *Right to Information Act 2009*) or as required by Parliament. This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002*.

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Date received		Reference numbers	

NOTIFICATION OF ENGAGEMENT OF A PRIVATE CERTIFIER

To [ ] Council. I have been engaged as the private certifier for the building work referred to in this application

Date of engagement	Name	BSA Certification license number	Building classification/s

QLEAVE NOTIFICATION AND PAYMENT (For completion by assessment manager or private certifier if applicable.)

Description of the work	QLeave project number	Amount paid ($)	Date paid	Date receipted form sighted by assessment manager	Name of officer who sighted the form

The *Sustainable Planning Act 2009* is administered by the Department of Infrastructure, Local Government and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agency.

IDAS form 23—Tidal works and development within the coastal management district

(*Sustainable Planning Act 2009* version 3.1 effective 3 August 2015)

This form must be used for development applications for:

- operational work that is tidal works (including prescribed tidal works) or operational work within the coastal management district (mentioned in the Sustainable Planning Regulation 2009, schedule 7, table 2, item 13)
- material change of use that requires referral under the Sustainable Planning Regulation 2009, schedule 7, table 3, item 5 because it involves:
  - operational work carried out completely or partly in the coastal management district; or
  - building work carried out completely or partly in the coastal management district that is the construction of a new premises with a gross floor area (GFA) of at least 1000m^2 or the enlargement of the GFA of an existing premises by more than 1000m^2
- reconfiguring a lot that requires referral under the Sustainable Planning Regulation 2009, schedule 7, table 2, item 14 because the land is situated completely or partly in the coastal management district or the reconfiguration is in connection with the construction of a canal
- building work that requires referral under the Sustainable Planning Regulation 2009, schedule 7, table 1, item 11 because it is on land completely or partly seaward of a coastal building line.

You **MUST** complete **ALL** questions that are stated to be a mandatory requirement unless otherwise identified on this form.

Notes for completing this form

For all development applications you must:

- complete *IDAS form 1—Application details*
- complete any other forms relevant to your application
- provide any mandatory supporting information identified on the forms as being required to accompany your application.

Attach extra pages if there is insufficient space on this form.

All terms used on this form have the meaning given in the *Coastal Management and Protection Act 1995*, the Coastal Protection and Management Regulation 2003, the *Sustainable Planning Act 2009* (SPA) or the Sustainable Planning Regulation 2009.

Mandatory requirements

1. Confirm the following mandatory requirements accompany this application	**Confirmation of lodgement**	**Method of lodgement**
Written description of the proposal, including a report that addresses any relevant policies.	☒ Confirmed	Online / within Supporting Document

2. What is the nature of the work or development proposed by the application? (Tick all applicable boxes.)

☒ Operational work—complete table A

☐ Material Change of Use—complete table B

☐ Reconfiguring a Lot—complete table C

☐ Building Work—complete table D

Table A—Operational Work

Does the operational work involve the following? (Tick all applicable boxes.)

a) Tidal works as defined under the *Coastal Protection and Management Act 1995* (e.g. basins, breakwater, bridges, boat ramps, decks and boardwalks, docks, dockyards, groynes, jetties, marinas, pipelines, pontoons, powerlines, seawalls, slips, training walls, wharves and the reclamation of land under tidal water)?

☐ No ☒ Yes

If yes, what is the purpose?

Riverbanks adjacent to the Mossman Wastewater Treatment Plant (MWTP) have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. During and following significant rainfall events, slip scarps have been encroaching site boundary fences and buried services. Future progression of observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure.

☐ Private purpose (e.g. private pontoon)

☐ Another purpose (e.g. commercial marina)

Does the tidal works also require resource allocation under the *Coastal Protection and Management Act 1995*?

☒ No ☐ Yes

If applicable what is the estimated value of the proposed works?

b) Interfering with quarry material as defined under the *Coastal Protection and Management Act 1995* (e.g. excavating or moving sand, gravel or any other earth material on state coastal land such as roads, esplanades, parks or unallocated state land) on state coastal land above high-water mark.

☐ No ☒ Yes

If yes, which of the following?

☐ Works for coastal management purpose involving beach nourishment, dune fencing, revegetation of dunal areas with endemic native plants, or stinger net enclosures.

☐ For purposes directly related to the provision of lifesaving or rescue services by a volunteer community organisation.

☒ For other purposes (please state below).

Riverbank Stabilisation Works

If applicable what is the estimated value of the proposed works?

$2,020,000 (all works, not just tidal)

c) Disposing of dredge spoil or other solid waste material in tidal water?

☒ No ☐ Yes

If applicable what is the estimated value of the proposed works?

d) Constructing an artificial waterway?

☒ No ☐ Yes

If applicable what is the length of the waterway?

e) Removing or interfering with coastal dunes on land, other than state coastal land, that is in an erosion prone area as defined in the *Coastal Protection and Management Act 1995* and above high water mark (e.g. lowering dune vegetation on freehold and leasehold land)?

☒ No ☐ Yes

If applicable what is the estimated value of the proposed works?

Table B—Material change of use

a) Does the material change of use involve the following? (Tick all applicable boxes.)

☐ Operational work carried out completely or partly in the coastal management district

b) Does the material change of use involve building work carried out completely or partly in the coastal management district that is:

☐ the construction of new premises with a gross floor area of at least 1000 m^2

☐ the enlargement of the gross floor area of existing premises by more than 1000 m^2

Table C—Reconfiguring a lot

a) Does the reconfiguring a lot involve the following? (Tick all applicable boxes.)

☐ Land situated completely or partly in the coastal management district

☐ The construction of a canal

b) How many lots will be created?

Table D—Building work

a) Is the building work on land completely or partly seaward of the coastal building line under the *Coastal Protection and Management Act 1995*?

☐ No ☐ Yes

3. Is the tidal works located within a local government tidal area? (Tick all applicable boxes)

☐ No ☒ Yes—provide details below

Local government:	**Douglas Shire Council**

Mandatory supporting information

4. Please provide the following information	**Confirmation of lodgement**	**Method of lodgement**
For all applications		
A statement addressing the relevant part(s) of the State Development Assessment Provisions (SDAP).	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
For applications involving operational work that is tidal works		
A copy of the certificate of title for the land (including tidal land) that would abut or adjoin the proposed works.	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
Plans showing: • the real property description and boundaries of the land (including tidal land) that would abut or adjoin the proposed works • the proposed works (including existing works to be removed) in relation to relevant tidal planes (e.g. mean high water springs) • the slope angles of the beds and banks of the tidal area and the finished levels of the proposed works.	☒ Confirmed ☐ Not applicable	
For tidal work that will occupy a navigable waterway provide a water allocation area plan providing evidence that the proposed work will not prejudice the access rights of adjoining property owners.	☐ Confirmed ☒ Not applicable	

Details of the largest vessel, if any, to be moored at the structure.	☐ Confirmed ☒ Not applicable	
For prescribed tidal works, details of how the proposed work addresses the IDAS code for prescribed tidal work in the Coastal Protection and Management Regulation 2003, schedule 4A.	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
If applicable, certification that the design of tidal works is suitable for intended use, signed by a Registered Professional Engineer of Queensland (or equivalent).	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
For applications involving material change of use		
Plans certified by a registered professional engineer of Queensland (RPEQ) or a registered surveyor showing: • the real property description and boundaries of the land • the proposed works in relation to the location of the coastal management district and coastal hazards.	☐ Confirmed ☒ Not applicable	
For applications involving reconfiguring a lot		
Plans certified by a registered surveyor showing: • the real property description and boundaries of the land • The location of the coastal management district and coastal hazards in relation to the land being reconfigured • Any land being surrendered as a separate lot on the plan of subdivision.	☐ Confirmed ☒ Not applicable	
For applications involving building works seaward of a coastal building line		
Plans certified by a registered professional engineer of Queensland (RPEQ): • the real property description and boundaries of the land • the proposed works in relation to the location of the coastal building line.	☐ Confirmed ☒ Not applicable	

Notes for completing this form

- Please ensure all applicable fees are paid, noting that referral agency fees are to be paid to the Department of Environment and Heritage Protection.
- For an application requiring referral to the Department of Transport and Main Roads (DTMR), it is recommended that the applicant contact DTMR to ensure that required information for assessment of the application is provided.

Privacy—Please refer to your assessment manager, referral agency and/or building certifier for further details on the use of information recorded in this form.

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Date received		Reference numbers	

The *Sustainable Planning Act 2009* is administered by the Department of Infrastructure, Local Government and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agency.

IDAS form 27—Waterway barrier works

(*Sustainable Planning Act 2009* version 3.2 effective 3 August 2015)

This form must be used for development applications for operational work that is the constructing or raising of waterway barrier works.

You **MUST** complete **ALL** questions that are stated to be a mandatory requirement unless otherwise identified on this form.

For all development applications you must:

- complete *IDAS form 1—Application details*
- complete any other forms relevant to your application
- provide any mandatory supporting information identified on the forms as being required to accompany your application.

Attach extra pages if there is insufficient space on this form.

All terms used on this form have the meaning given in the *Sustainable Planning Act 2009* (SPA), the Sustainable Planning Regulation 2009, the *Fisheries Act 1994* or the Fisheries Regulation 2008.

Mandatory requirements

1. Has a Fish Movement Exemption Notice been issued for the proposed work?

☐ Yes – submit with this application, a copy of the Fish Movement Exemption Notice for the proposed work.

☒ No – submit with this application, details of how the proposed work provides for adequate fish movement.

2. What is the nature of the proposed work? (Tick all applicable boxes.)

☐ Construction of a new waterway barrier/s

☒ Temporary waterway barrier/s

☒ Partial waterway barrier/s

☐ Raising an existing waterway barrier/s

☒ Permanent waterway barrier/s

☐ Bank to bank waterway barrier/s

3. What is the type of the proposed work? (Tick all applicable boxes.)

	Number of barriers
☐ Dam, weir or a barrage (complete section 4)	
☐ Culvert (complete section 5)	
☐ Causeway (complete section 6)	
☐ Bridge pylon (abutments or pile foundations) (complete section 6)	
☐ Flow control structure such as a floodgate (complete section 6)	
☐ Pollution control device such as trash rack or a boom gate (complete section 6)	
☐ Levee bank across a waterway (complete section 6)	
☒ Other—please specify (e.g. groyne, construction platform, sediment curtain, causeway) (complete section 6)	Number of barriers
Revetment Walls	2 permanent: revetment walls.

4. Constructing a new or raising an existing dam, weir, barrage, bund wall, coffer dam or other similar structures

The application is seeking approval for: ☐ new barrier ☐ raising of an existing barrier

Briefly describe the type of barrier proposed (i.e. dam, weir, tidal barrage, etc.)

For a temporary barrier (i.e. in place less than 12 months), how many days will the barrier be in place? _____ days

Will the barrier extend across the waterway from bank to bank?

☐ Yes

☐ No – how long is the proposed barrier (across the waterway)? _____ metres

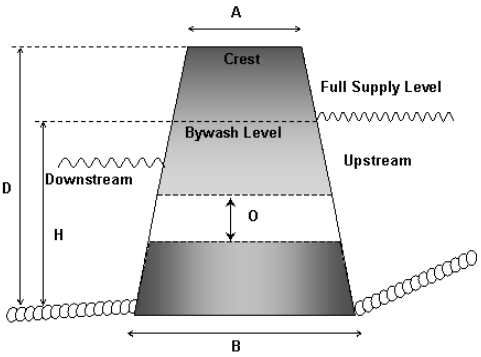
– how wide is the waterway (bank to bank)? _____ metres

What is the purpose of the proposed barrier? (E.g. creating a new or increasing the capacity of the existing water storage, maintenance work, etc.)

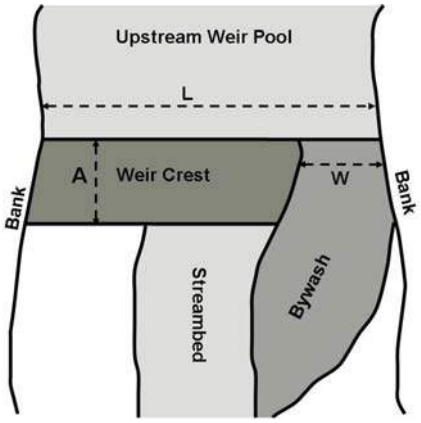
What are the details of the proposed construction materials? (E.g. earth, concrete, rock fill, steel, timber, sand, etc.)

Please refer to the attached Design Report (GHD 2017) for details of construction materials and construction generally. Construction materials will be reinforced rock fill with geotextile.

In reference to the diagrams below, provide the following details of the proposed barrier:



Cross section of barrier



Aerial view of waterway

• total crest height (D)		metres
• thickness (A) of crest		metres
• height of spillway / bywash (H)		metres
• width of spillway / bywash inlet (W)		metres
• base width (B)		metres
• internal diameter (O) of outlet pipe/works and discharge capacity		milli-metres
• length of wall (L)		metres
• distance of backup from barrier wall at full supply level		metres
• volume of storage.		mega-litres
• If raising an existing waterway barrier:		
- additional height above existing crest		metres

- method of raising (e.g. capping crest, inflatable bag, gates etc.).

Does the application involve more than one barrier addressed by this section?

☐ Yes - generate another section 4 response for each barrier and submit with the application.

☐ No - if the application involves another type of barrier identified in section 3, go to the relevant section identified.

- if the application does not involve another type of barrier identified in section 3, go to section 7.

5. Constructing a new or modifying (including maintenance and replacement of) an existing culvert

What is the nature of the proposed work?

- ☐ Construction of a new culvert
- ☐ Maintenance of an existing culvert
- ☐ Replacement of an existing culvert

What is the purpose of the proposed culvert?

For a temporary barrier (i.e. in place less than 12 months), how many days will the culvert be in place? _____ days

Will the culvert extend across the waterway from bank to bank?

- ☐ Yes
- ☐ No
  - how long is the proposed culvert (across the waterway)? _____ metres
  - how wide is the waterway (bank to bank)? _____ metres

What type of culvert is proposed?

- ☐ Box culvert
- ☐ Arch culvert
- ☐ Pipe culvert
- ☐ Combination culvert
- ☐ Other—please specify: _____

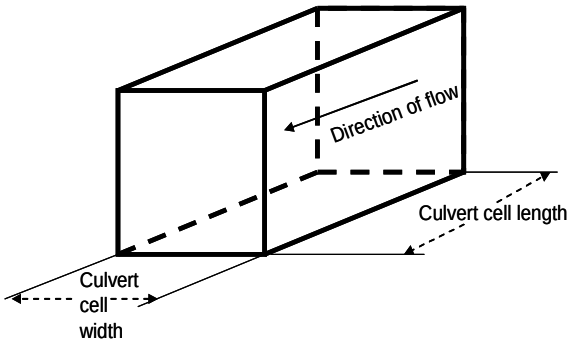
In reference to the diagrams below, provide the following details of the proposed culvert.

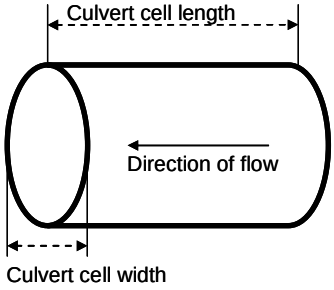
How many culvert cells are there? _____

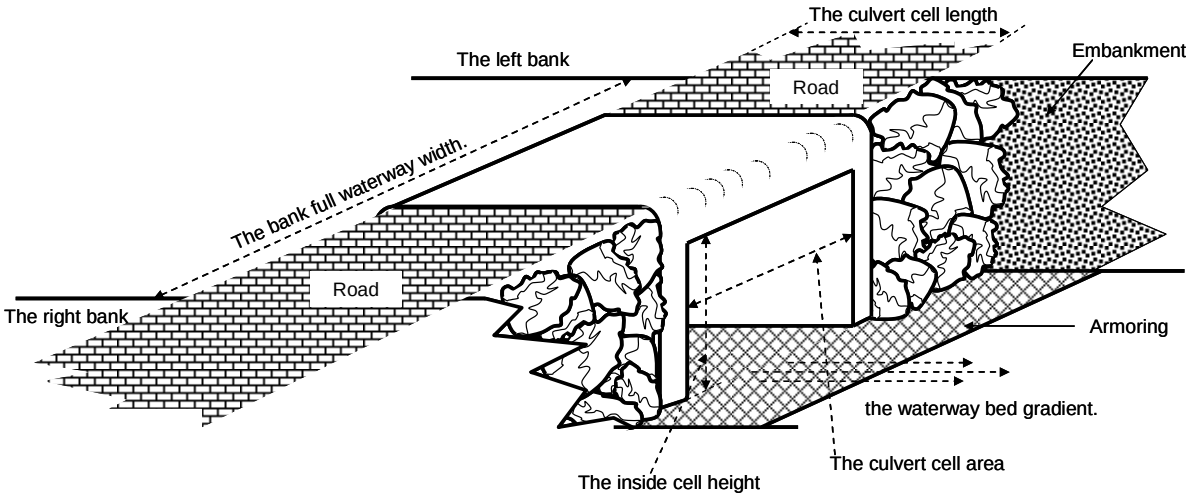
What is the upstream downstream culvert cell length? _____ metres

What is the inside cell width of each culvert (or diameter of pipe culvert)? _____ metres

What is the internal height within the culvert cell? _____ metres







Does the application involve more than one culvert?

☐ Yes - generate another section 5 response for each culvert and submit with the application.

☐ No - if the application involves another type of barrier identified in section 3, go to the relevant section identified.

- if the application does not involve another type of barrier identified in section 3, go to section 7.

6. Constructing a new or modifying (including maintenance and replacement) an existing waterway barrier except those listed in sections 4 and 5.

What is the nature of the proposed work?

☒ Construction of a new barrier

☐ Replacement of an existing barrier

☐ Maintenance of an existing barrier

Briefly describe the proposed barrier.

Rock revetment wall. Approximately 78 m of embankment on the South Mossman River.

For a temporary barrier (i.e. in place less than 12 months), how many days will the barrier be in place? _____ days

Will the barrier extend across the waterway from bank to bank?

☐ Yes

☒ No - how long is the proposed barrier (across the waterway)? _____

- how wide is the waterway (bank to bank)? _____ metres

What is the purpose of the proposed barrier?

River banks adjacent to the Mossman Wastewater Treatment Plant (MWTP) have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. During and following significant rainfall events, slip scarps have been encroaching site boundary fences and buried services. Future progression of observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure

What is the maximum height of the proposed barrier above the existing bed level? 11 metres

What are the proposed construction materials? (E.g. earth, concrete, rock fill, steel, timber, sand, etc.)?

Geosynthetic fabric underlay and rockfill.

Does the barrier follow the natural gradient of the bed level?

☒ Yes

☐ No

Does the application involve more than one barrier under this section?

☐ Yes - generate another section 6 response for each barrier and submit with the application.

☐ No - go to section 7.

6. Second Barrier Response

What is the nature of the proposed work?

☒ Construction of a new barrier

☐ Replacement of an existing barrier

☐ Maintenance of an existing barrier

Briefly describe the proposed barrier.

Rock revetment wall. Approximately 75 m of embankment on the Mossman River systems are required to be reconstructed utilising geosynthetic fabric and rockfill.

For a temporary barrier (i.e. in place less than 12 months), how many days will the barrier be in place? _____ days

Will the barrier extend across the waterway from bank to bank?

☐ Yes

☒ No - how long is the proposed barrier (across the waterway)? _____

- how wide is the waterway (bank to bank)? _____ metres

What is the purpose of the proposed barrier?

River banks adjacent to the Mossman Wastewater Treatment Plant (MWTP) have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. During and following significant rainfall events, slip scarps have been encroaching site boundary fences and buried services. Future progression of observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure

What is the maximum height of the proposed barrier above the existing bed level? 10 metres

What are the proposed construction materials? (E.g. earth, concrete, rock fill, steel, timber, sand, etc.)?

Geosynthetic fabric underlay and rockfill.

Does the barrier follow the natural gradient of the bed level?

☒ Yes

☐ No

Does the application involve more than one barrier under this section?

☐ Yes - generate another section 6 response for each barrier and submit with the application.

☐ No - go to section 7.

Mandatory supporting information

7. Confirm the following mandatory supporting information accompanies this application.

Mandatory supporting information	**Confirmation of lodgement**	**Method of lodgement**
Location details for all applications		
A scale map/sketch plan of the site and the neighbouring area identifying: • the site of the proposed works on the waterway • the names of the waterway and the catchment in which the waterway is located • stream order • where the (site) waterway joins with another, more major waterway (or coastal waters) downstream • other easily identifiable geographical features adjacent to the proposed works • the limit and area of impounded waters (upstream weir pool) at full supply level (if relevant).	☒ Confirmed	Online / within Supporting Document
GPS coordinates and zone references of the works site (GDA94 preferred).	☒ Confirmed	Online / within Supporting Document
Photographs of the site and the waterway upstream and downstream of the works site.	☒ Confirmed	Online / within Supporting Document

A scale plan showing the limit of and area of impounded waters at full supply level.	☒ Confirmed	Online / within Supporting Document
Details of the proposed development for all applications		
Justification and the benefits of the proposed waterway barrier works.	☒ Confirmed	Online / within Supporting Document
Assessment of lesser impact alternatives and reasons for the proposed waterway barrier.	☒ Confirmed	Online / within Supporting Document
Details of the proposed waterway barrier.	☒ Confirmed	Online / within Supporting Document
Details of the structure and management of the impoundments.	☒ Confirmed	Online / within Supporting Document
Details of the proposed maintenance program on the waterway barrier after construction.	☒ Confirmed	Online / within Supporting Document
A statement addressing the relevant part(s) of the State Development Assessment Provisions (SDAP).	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
Details of the waterway for all applications		
A scaled plan showing a cross-section of the stream profile at the proposed location.	☒ Confirmed	Online / within Supporting Document
Description of the stream morphology at the proposed location, and up to 1 km upstream and downstream (e.g. width and depth of stream, stream bed substrate types, bank stability, presence of pools, rifle runs, sand bars, etc.).	☒ Confirmed	Online / within Supporting Document
Description of the riparian habitats at and adjacent to the proposed location (e.g. Intact native vegetation, presence of weeds and other disturbances).	☒ Confirmed	Online / within Supporting Document
Description of the stream hydrology (e.g. flood frequency and height, altered flow regimes due to existing waterway barriers) • *Note: for most applications involving permanent waterway barriers on larger waterways, specific data on stream hydrology and flood levels will be required.*	☒ Confirmed	Online / within Supporting Document
Description of likely changes to stream hydrology resulting from construction of the proposed barrier. • *Note: for most applications involving permanent waterway barriers on larger waterways, the results of hydrological modelling will be required to show expected changes to flow characteristics, particularly velocity, at different water levels, expected headwater/tail water differences at different water levels, and frequency, timing and duration of drown-out of the proposed structure.*	☒ Confirmed	Online / within Supporting Document
Aquatic ecology details for all applications		
Description of the aquatic ecology at, and adjacent to, the proposed location, including instream fauna and flora, fish assemblages, and endangered or vulnerable fish species.	☒ Confirmed	Online / within Supporting Document

Description of likely impacts on fish movements as a result of construction of the waterway barrier, with reference to expected changes instream hydrology.	☒ Confirmed	Online / within Supporting Document
Description of likely impacts on both riparian and aquatic habitats as a result of construction of the waterway barrier, including impacts due to the expected changes instream hydrology.	☒ Confirmed	Online / within Supporting Document
Description of any proposed disturbances to riparian and aquatic habitats associated with construction activities (e.g. site access for machinery and personnel, material laydown areas, potential turbidity or other water quality impacts).	☒ Confirmed	Online / within Supporting Document
Details of the construction for all applications		
Scaled drawings of the proposed waterway barrier works.	☒ Confirmed	Online / within Supporting Document
If a fishway is proposed, scaled drawings of the fishway and details of proposed operation and maintenance of the fishway.	☐ Confirmed ☒ Not applicable	
Time frame for construction of the proposed barrier.	☒ Confirmed	Online / within Supporting Document
Mitigation details for all applications		
Description of any design features of the proposed waterway barrier that will help to mitigate the impacts of the structure on fish movements.	☐ Confirmed ☒ Not applicable	
Description of all measures that will be implemented during the construction period to mitigate the impacts of construction on aquatic habitats.	☒ Confirmed	Online / within Supporting Document
Description of all measures that will be undertaken at the completion of construction activities to restore the site to its previous condition or better.	☒ Confirmed	Online / within Supporting Document

For applications relating to section 5 of this form (separate information to be provided for each barrier)		
Culvert design information including: • whether the invert of the culvert is above, at or below waterway bed levels • size, angle, numbers and position of any baffles along the inner walls of the culverts • details of the culvert cell bed (bed material, rocks to aid fish passage, riffle, smooth concrete or roughness, baffles, etc) • whether there will be a low flow channel culvert in any multi-cell culverts • detail on whether the culvert base gradient is less than, the same as or more than the natural gradient of the waterway bed.	☐ Confirmed	
For applications relating to section 6 of this form (separate information to be provided for each barrier)		
All dimensions of the barrier	☒ Confirmed	Online / within Supporting Document
Detailed drawings of the barrier design	☒ Confirmed	Online / within Supporting Document

The operational requirements of the barrier	☒ Confirmed	Online / within Supporting Document
Details of any aprons, embankments or other erosion control methods	☒ Confirmed	Online / within Supporting Document
The specific structural inclusions to improve fish passage across the barrier	☒ Confirmed	Online / within Supporting Document

Privacy—please refer to your assessment manager, referral agency and/or building certifier for further details on the use of information recorded in this form.

OFFICE USE ONLY

Date received		Reference numbers	

The *Sustainable Planning Act 2009* is administered by the Department of Infrastructure, Local Government and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agency.

Douglas Shire Council

Mossman Waste Water Treatment Plant

Environmental Supporting Report

June 2017

Executive Summary

Project: Mossman Wastewater Treatment Plant River Bank Stabilisation

Applicant: Douglas Shire Council

Registered Site Description: Works extend over: Waterway tenure (South Mossman River), Road reserve (Junction Road), Lot 24 RP800985, Lot 22 RP800895, Lot 26 RP804231

Site Area: Site A: Northwest of MWTP E326837 N8180562. Site B: southwest of MWTP E326867 N8180528.

Zone: Douglas Shire Council Planning Scheme indicates works extend over road reserve, community and recreational, rural and conservation zones

Application Type [(1)]:

Aspects Development	Type of Approval	
	PA	DP
MCU	☐	☐
RoL	☐	☐
BW	☐	☐
OW	☐	☒

Pre-lodgement / Consultation with Relevant Parties:

Party	Y / N	Details (i.e. data, contact)
Assessment Manager	☐☒	
Referral Agencies	☒☐	MyDAS reference SPL-1216-035975
Community	☐☒	

Assessment Manager: Douglas Shire Council

Referral Agencies: State Assessment and Referral Agency

Level of Assessment: ☒ Code ☐ Impact

Public Notification: ☒ no ☐ yes **If Yes:** ☐ 15 ☐ 30 Business Days

Application under Superseded Planning Scheme: ☒ no ☐ yes

IDAS Application Forms: IDAS Form 1 - Application details, Form 23 – Tidal Works & Development, Form 27 – Waterway Barrier Works.

Resource Entitlement: ☒ no ☐ yes

Owners Consent: ☐ no ☒ yes

IDAS Consultant and Contact: GHD Pty Ltd (attention: Mr Andrew Small or Kylie Cauchi) PO Box 819 Cairns, QLD, 4870.	Ph: 07 4044 2206 or 07 4044 2009 Email: andrew.small@ghd.com or kylie.cauchi@ghd.com

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.4 and the assumptions and qualifications contained throughout the Report.

[1]Preliminary Approval (PA), Development Permit (DP), Material Change of Use (MCU), Reconfiguration of a Lot (RoL), Building Works (BW), Operational Works (OW)

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1. Introduction

1.1 Background

The Mossman Wastewater Treatment Plant (MWTP), owned and operated by Douglas Shire Council (DSC), is located on land between the Mossman River and the South Mossman River where the MWTP boundaries (eastern and western) have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. In addition, during and following significant rainfall events, slip scarps have been encroaching the site boundary fences and buried services. Future progression of the observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure. Therefore, GHD have been engaged to undertake the design of bank stability / protection measures to minimise future risk of instability affecting the operation of the MWTP.

1.2 Report Purpose

This report is has been prepared on behalf of DSC to provide supporting information for a development application for operational works approval for the bank stabilisation works. The report provides information to enable an assessment of the works to be undertaken by DSC as Assessment Management and the Department of Infrastructure, Local Government and Planning (DILGP) via the State Assessment and Referral Agency (SARA) to coordinate the referral agency response.

The report further outlines:

- Environmental values pertinent to the construction footprint and potential impact zones
- Management measures to be implemented by the Contractor within an EMP in relation to environmental issues
- Assessment against the relevant State Development Assessment Provisions.

1.3 Operation Works Approval Trigger

GHD have untaken a review of the assessment development requirements of the *Sustainable Planning Regulation 2009* (SP Reg) in conjunction with pre-lodgement advice that was obtained from DILGP/SARA dated 1 February 2017 (reference SPL-1216-035975. The assessable development triggers have been identified to include:

- SP Reg Schedule 3, Table 4, Item 5 Operational works that is:
  - Tidal works
  - Interfering with quarry material as defined under the Coastal Protection and Management Act on State coastal land above high water mark.
- SP Reg Schedule 3, Table 4, Item 6 Operational work that is the constructing or raising of waterway barrier works, other than operations work that is self-assessable development under part 2 or carried out on premises to which structure plan arrangement apply.

DSC have been identified as the Assessment Manager in accordance with the SP Reg Schedule 6, Table 1, Item 1(b). Note: Review of the plant assemblages, water quality and aquatic features indicates that the works within the South Mossman River may be considered under tidal influence, however the Mossman River at this point does not display any tidal characterises, and therefore is not considered “tidal works”.

Further information on assessment triggers is provided within this report.

1.4 Scope and Limitations

This report has been prepared by GHD for Douglas Shire Council and may only be used and relied on by Douglas Shire Council for the purpose agreed between GHD and the Douglas Shire Council as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Douglas Shire Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Douglas Shire Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Proposed Works

2.1 Location

MWTP plant is located approximately 0.5 km northeast of the town of Mossman, off Junction Road / Bonnie Doon Road. The site lies at the confluence of two rivers; the Mossman River that flows to the west of the site and the South Mossman River that flows to the east of the site. The confluence of the two rivers is approximately 0.25 km northeast of the MWTP. Figure 1 displays the location of the proposed works.

The extent of works for the two sites are described in Appendix B, with the approximate GPS coordinates of the site boundaries displayed in Table 1.

The MWTP site is relatively level with an elevation of approximately 8.50 m Australian Height Datum (AHD) and is approximately 180 m in length and 40 m in width. To the northwest and southeast, the site slopes steeply toward the two river channels that bound the site, a chainlink fence is located at the crest of these slopes. The two rivers that bound the site lie at approximately -0.50 m AHD. The flood level for the site is understood to be 6.76 m AHD.

Table 1: Proposed Works – Approximate Boundaries

Site A – Mossman River		Site B – South Mossman River	
Easting (m E)	Northing (m S)	Easting (m E)	Northing (m S)
326794.4	8180545.7	326853.1	8180496.0
326802.6	8180533.0	326872.6	8180496.0
326845.1	8180561.6	326878.4	8180513.8
326857.3	8180590.6	326897.9	8180547.3
326867.1	8180598.6	326908.7	8180576.2
326854.5	8180616.6	326889.8	8180586.7
326840.5	8180604.4	326855.4	8180520.2
326827.2	8180573.8	326853.1	8180496.2
326794.4	8180545.7		

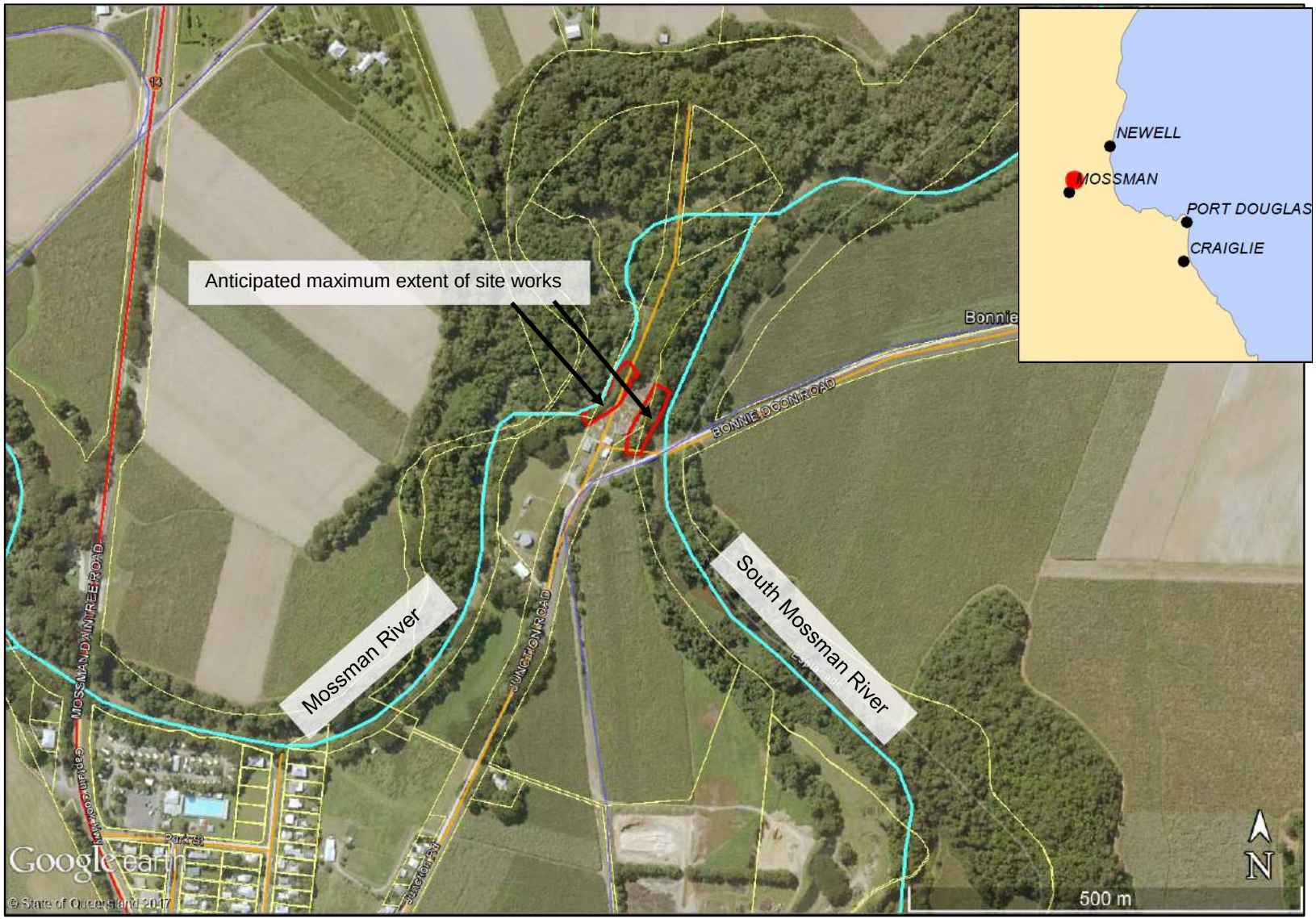


Figure 1: Project Location

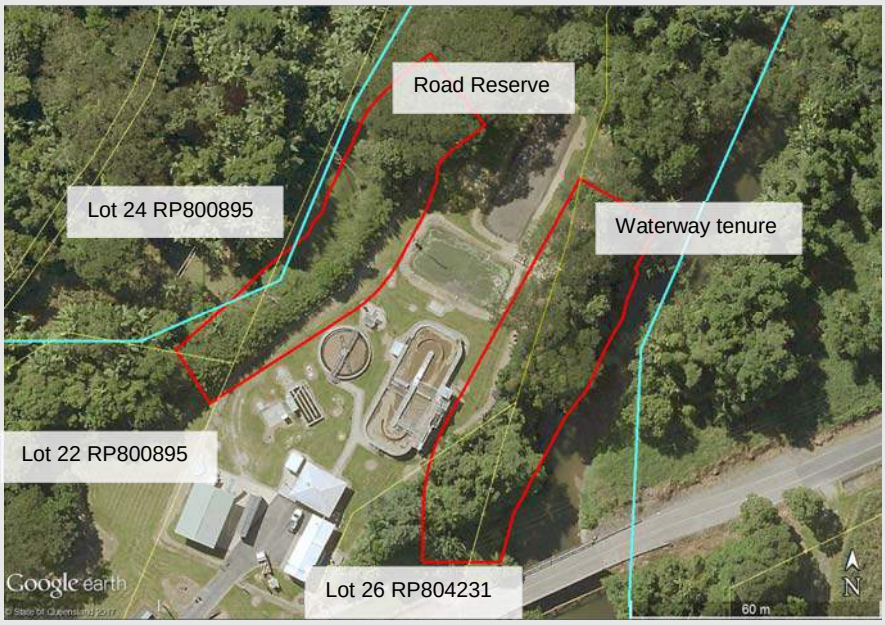
(Source: State of Queensland, Queensland Globe)

2.2 Project Description

2.2.1 Details

Table 2 provides a summary of the Project including options considered.

Table 2: Summary of Remedial Proposal

Aspect	Project Description
Purpose of Works:	Approximately 75 m of embankment on the Mossman and 78 m of the embankment of the South Mossman River is required to be reconstructed, with the use of geosynthetic liner and rockfill.
Commencement and Duration:	The works will be undertaken outside the wet season, in particular where surfaces are exposed. Works are anticipated to begin following development approval; pending weather the works period will be 2 to 3 months.
Real Property Description:	Works extend over: • Waterway tenure (South Mossman River) • Road reserve (Junction Road), • Lot 24 RP800985 (freehold) • Lot 22 RP800895 (freehold) • Lot 26 RP804231 (freehold). Land titles are provided in Appendix C.  *(Source: State of Queensland (2017), Queensland Globe)*
Options Considered:	A number of options were considered initially for the works: • 1 Gravity Stabilisation with Rockfill Options as follows:

Aspect	Project Description
	– 1a – Toe Berm Only (allowing vegetation in upper portion to remain) – 1b – Minor Cutback (1V:1H) plus rockfill blanket – 1c – Major Cutback (1V:2H) plus rockfill blanket with berm – 1b-c Hybrid – Optimised cutback (1v:1.5H) plus rockfill blanket with berm. • 2 Embedded Wall Construction. • 3 Slope Reinforcement (soil nailing). Option 1 b-c Hybrid has been selected based on discussions with DSC and the Regulators. The following provides a summary. Option 1 incorporated rockfill as toe stabilisation to increase the restoring moment in circular slip failure analyses. Treatment levels were subdivided according to their level of intensity and capital expenditure. The hybrid may provide a balance between site constraints and a resilient slope. An average slope of 1V:1.5H and a 1 m wide bench at RL4 provides factors of safety between that of Options 1b and 1c for longterm groundwater conditions. Based on resilience and cost considerations, together with DSC project objectives and maintenance access to infrastructure, it is expected that Options 2 or 3 will not be accepted. Therefore, in order to provide protection to the bank prior to the 2017/2018 Wet Season, to prevent further erosion and loss of riparian vegetation, an approval is being sought for Option 1 b-c Hybrid.
Justification:	Riverbanks adjacent to the MWTP have been subject to ongoing instability and slope failures in recent years. During and following significant rainfall events, slip scarps have encroached upon site boundary fences and buried services. Future progression of observed bank instability may place key WWTP structures at risk of serviceability loss or structural failure.

2.3 Design Drawings

The design drawings in Appendix B. The works have been certified by a Registered Professional Engineer Queensland (RPEQ).

2.4 Construction methodology and materials

The construction methodology for the rock revetment will be confirmed by the Contractor upon engagement. However it is anticipated to include:

- Site preparation works including the establishment of erosion and sediment protection devices, clearing and grubbing as required to accommodate the new walls.
- Rock of suitable size and quality to be stockpiled on site for inspection. Approval for use in the works to be provided by the Superintendent's representative.

- Exposed banks to be battered to design slope. Filling and excavation completed as required.
- Geotextile to be laid across the section (from the crest to the toe) with a 0.5 m overlap.
- Rock revetment to be constructed for complete extent of revetment walls.

The materials have been chosen to be in accordance with the *Operational work on State coastal land guideline, version 5* prepared by EHP.

2.4.1 Excavation

The upslope face of the excavation is to be cut vertically where temporary excavation stability permits (or as close to vertical as possible). Any necessary temporary excavation support shall be designed and installed by the Contractor.

The in situ material at the foundation and behind the rockfill zone shall be stiff (or better) undisturbed silty clays, with undrained shear strength of not less than 50kPa. Any failed or slipped material encountered in the excavations shall be over-excavated and replaced with rockfill. Lenses of predominantly sandy materials may be encountered in the foundation excavation, and these may require locally flatter temporary cut batters.

Where appropriate, the area above temporary excavations shall remain cordoned off to reduce the risk to the public and to reduce surface loading at the crest. An assessment is to be made by the Contractor regarding construction plant loading adjacent to vertical batters, and temporary works (i.e. working platforms) are to be provided as necessary to ensure stability. Where necessary, working platforms shall be designed by registered professionals to current industry standards for the plant type proposed.

2.4.2 Geosyntheic Placement

The geosynthetic separator shall comprise a nonwoven geosynthetic compliant with MRTS27 Strength Class E and Filtration Class III. The geosynthetic shall be handled, stored, fabricated and installed in accordance with the manufacturer's recommendation. The geosynthetic shall be placed at the locations shown on the drawings. Temporary restraint on the upslope side may be necessary in order to ensure coverage up the vertical face of the excavation.

2.4.3 Rockfill Material Placement

All Rockfill used for the project shall comply with Section 14.2.3 of MRTS04, with the following additional requirements:

- Sedimentary rock shall not be used
- The D50 of the rockfill shall be not less than 500 mm
- The Degradation Factor requirement of minimum 30 shall apply.

Rockfill shall be placed in a bottom-up sequence, meaning that rockfill at the toe shall be placed first, with filling proceeding in an upslope direction with each successive layer placement. Placement of rockfill by rolling materials down slopes is not permitted due to the risk of inducing slope instability. Surcharging of batters (for example by inadvertent placement of rock stockpiles) is not permitted. Top-down placement of rockfill is not permitted due to the risk of inducing slope instability.

2.4.4 Rockfill Revetment End Transitions

Additional rockfill shall be placed for a distance of not less than 3 m beyond the extents shown on the drawings such that the rockfill surface grades evenly back to the natural bank profile. Abrupt changes in river cross sectional profiles create adverse hydraulic effects and accordingly are to be avoided.

2.4.5 Pavement Construction

Upon completion of the rockfill operations, the rockfill shall be capped with unsealed pavement as shown on the drawings. The layout and extent of pavement behind the crest shall be as directed by DSC. At the interface between rockfill and pavement, smaller rockfill particles shall be placed over the rockfill to provide an even surface, and two layers of separating geosynthetic shall be placed. The geosynthetic shall meet the requirements of MRTS27 Strength Class E and Filtration Class III.

2.5 Operation / Maintenance of the Revetments

Routine inspections will be undertaken by DSC as part of the MWTP operation. If an issue is noted, such as erosion or rock wall failure, it will be reported and corrective action will be taken when appropriate.

3. Environmental Values and Potential Impacts

This section provides background on the values that are key to the management of the operational works (for bank stabilisation) and details on the anticipated impacts.

3.1 Soils

3.1.1 Soil Type and Erosion

A site walkover inspection conducted in January 2017 indicated that the soils present are typically sands, silts and clays which is in agreement with the anticipated geology based on available mapping and borehole data for the site.

Numerous historical geotechnical investigations were undertaken for structures within MWTP or to address the regressing slope that originally extended approximately 2.0 m outside of the fence line that bounds the site.

The failure mode for the Mossman River (Site A), appears to be recurrent shallow translational slides (nominally 0.25 m to 0.75 m depth). The failure mode for the South Mossman River (Site B) appears to be also a recurrent shallow translational slide (nominally 0.50 m to 0.75 m depth). It is likely that failed material has been transported by the river away from the sites. Both sites are located on the outside of a bend in the Mossman and South Mossman Rivers, which typically are areas of increased erosive potential.

3.1.2 Acid Sulfate Soils

Acid sulfate soils (ASS) are typically found where the natural ground level is less than 20 m Australian Height Datum (AHD) and where excavation below 5 m AHD is required. The Project involves excavation (and minor filling) in land that is less than 5 m AHD and as such ASS are to be considered. Available nearby test pit and laboratory information[2] suggests that soils at the site are acidic, but not acid sulfate soils as defined in the Queensland Acid Sulfate Soils Technical Manual[3]. However, the presence of acid sulfate soils within materials to be excavated cannot be definitively discounted on the basis of the available information.

If ASS are encountered on site and not appropriately managed, there is potential that upon exposure to oxygen, the soils will oxidise and produce acid and dissolved metals. This then has the potential to impact upon aquatic ecosystem health, structural installations and water quality. Further information on the required actions to determine risk is provided in Section 5.1.3.

3.2 Hydrology and Coastal Environment

3.2.1 Waterways

The project includes works on the banks of the Mossman River and the South Mossman River. Both rivers are identified as major risk (purple) waterways for waterway barrier works and are identified as watercourses for the purposes of the *Water Act 2000*.

[2] Engineering Testing Services (Cairns) Pty Ltd (May 2007) – Report on Geotechnical Investigation, Proposed Mossman Sewerage Treatment Plant Upgrade.
[3] Queensland Government (2014) – Queensland Acid Sulfate Soil Technical Manual, Version 4.0

The area of proposed works is approximately 350 m upstream of the confluence of the Mossman and South Mossman Rivers. The Mossman River flows to the west of the eroded sites and the South Mossman River flows to the east of the sites. To the northwest and southeast, the riverbanks slope steeply toward the two river channels.

The works aim to remediate the eroding banks, match the adjacent bank profiles and provide protection from further erosion and to public infrastructure and to provide batter protection to the banks from flows of up to 3 m/second generated during future wet seasons.

The following plates indicate the characteristics of the Rivers.

	Plate 1: Mossman River upstream
	Plate 2: Mossman river downstream

	Plate 3: South Mossman River opposite bank
	Plate 4: South Mossman River downstream

Water Quality Objectives

The water quality values and objectives relevant to the Mossman and South Mossman Rivers, a re-growth watercourse, are identified in the policy '*Environmental Protection (Water) Policy 2009 Daintree and Mossman River Basins Environmental Values and Water Quality Objectives' (Basin No. 109).* The proposed works will be undertaken in an area deemed to be moderately disturbed due to its proximity to sugarcane land and road infrastructure and the Mossman township.

The Environmental Values potentially relevant to the proposed works area, as identified in the policy, are listed in Table 3. Reference is made within this table as to whether the proposed works are consistent with achieving protection of the relevant Environmental Value (EV).

Table 3: Environmental Values

Environmental Value	Compatible with Project	Justification
Protection or enhancement of aquatic ecosystem values	✓	The works are to protect the bank after scouring and loss of habitat from ongoing slope instability issues that threaten MWTP infrastructure.

Environmental Value	Compatible with Project	Justification
Suitability for primary contact recreation	✓	The proposal will not impact the potential for primary contact recreation opportunities as the works are contained within the riparian zone of the Mossman and South Mossman Rivers.
Suitability for visual (no contact) recreation	✓	The proposal will improve the current condition of the wall/banks. Currently part of the bank is dominated by dense bamboo regrowth with gravel used to infill scour and erosion, this has resulted in an impact to the visual aesthetics.
Protection of cultural and spiritual values, including Traditional Owner values of water	✓	The works, while having a temporary impact on water quality during construction due to the likelihood of increased velocity and suspended solids, will overall improve the ecological health of the riparian zone. This in turn will assist with the protection of water quality values due to the natural processes and habitat connectivity that will occur as a result.
Suitability for industrial use	✓	The proposed works would not impede the development of industry, as it is adjacent to the existing MWTP.

The water quality objectives, as listed in the policy, most likely to be impacted from the construction works will be turbidity and Total Suspended Solids (TSS).

During construction there will be a risk of increased turbidity and TSS as a result of earthworks, due to the disturbance of bank material through benching and placement of rock in waters, causing degradation of water quality that has the potential to impact on local fish habitats. Erosion and sediment controls including instream silt curtains will be implemented to mitigate the impacts of sediment on local water quality (refer to Section 5.1.2). These impacts are expected to be temporary and reversible i.e. post construction there will be no ongoing impacts from the works on water quality.

Other aspects, e.g. potential for fuel spills and other potential water quality impacting issues will be addressed with the implementation of an EMP for construction (refer to Appendix F).

A water quality monitoring program will be established during the construction period to ensure that water quality objectives for the maintenance of habitat conditions conducive to sustaining the health and condition of fisheries resources. This will include a baseline assessment prior to construction and will be prepared and implemented by an appropriately qualified person. This monitoring program will identify threshold and trigger water quality parameters for actions, which will include hold points for construction.

It is also a requirement for the contractor to minimise the chance of overland flow into the Mossman and South Mossman Rivers from the works site, by diverting clean water around disturbed areas and treating contaminated water prior to any run-off. The contractor is to adhere to the EMP with respect to waste disposal, water quality and stormwater.

Additional details in relation to water quality are addressed within the State Development Assessment Provisions (SDAP) modules, refer to Section 6.

3.2.2 Wetlands

There are no mapped Wetland Protection Areas within or in proximity to the Project, nor wetlands on the vegetation management wetland map. However, EHP identify South Mossman River as being a general ecological significance wetland area. Potential impacts are as per Section 3.2.1.

3.2.3 Coastal Environment

The proposed riverbank stabilisation works on the Mossman and South Mossman Rivers, is adjacent to MWTP on Junction Road Reserve and located approximately 3.5 km upstream from the coastal fringe.

The Project extends over the following properties that are within the Coastal Management District (CMD), refer to Figure 2:

- Junction Road road reserve
- South Mossman River (waterway tenure)
- Lot 24 RP800895.

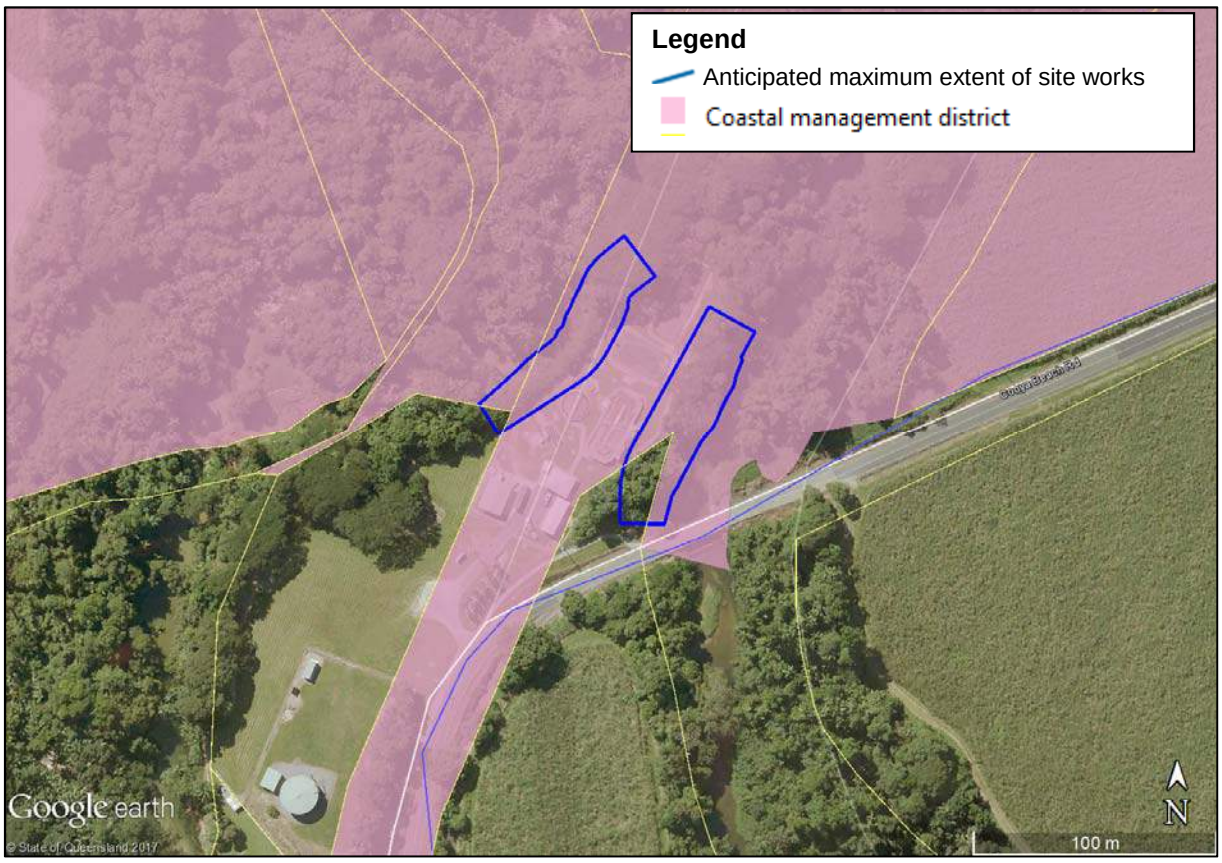


Figure 2: Coastal Management District Extent

(Source: State of Queensland (2017), Queensland Globe (DNRM))

These riverbank remediation works are a coastal protection measure due to their proximity to MWTP, which is considered essential community infrastructure. There is ongoing erosion and scouring, as well as storm tide events along the existing banks of both rivers that pose risks to MWTP infrastructure (a DSC local government asset).

In addition, review of the Department of Environment and Heritage Protection (EHP) coastal mapping indicates that the lower extents of the bank stability works are subject to coastal hazards of erosion prone area, medium storm tide inundation and high storm tide inundation.

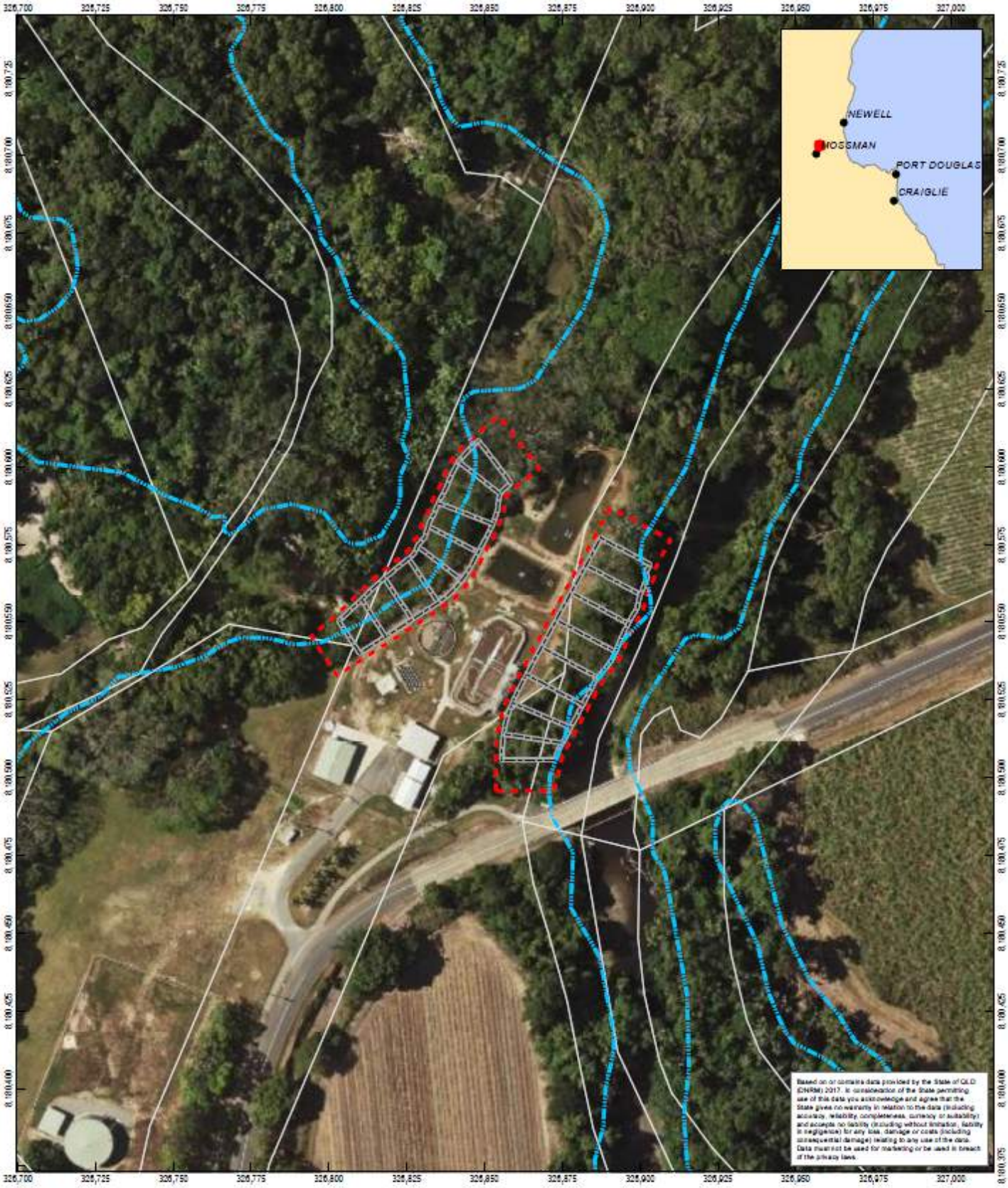
The riverbank stabilisation and revetment works are designed in accordance with relevant engineering standards, incorporating calculations associated with the hydraulics of the Mossman and South Mossman Rivers.

The RPEQ approved designs aim to withstand hazard categories identified at this location and to minimise the potential impacts to the banks and coastal zone. Refer to the design drawings in Appendix B.

Tidal Extent

Detailed information with regards to mean spring high tide and mean spring low tide is unavailable for the Mossman and South Mossman Rivers at this stage. Figure 3 provides the Highest Astronomical Tide (HAT) mapping that was extrapolated using elevation data. However, the sites are greater than 3.5 km upstream from the mouth of the Mossman River. Review of the characteristics of the sites indicates that:

- The revetment wall on the Mossman River (west of the MWTP), one of three anabranches, does not display any tidal characteristics, for example no marine plants or other aquatic indicators. Therefore, works are not considered tidal.
- The revetment wall on the South Mossman River (east of the MWTP), is influenced by the tides, including flow levels/volumes. Although there were no significant marine plants identified, other aquatic factors where. Therefore, the works are considered to include some tidal works.



LEGEND

- Highest astronomical tide
- Rockfall
- Anticipated maximum extent of site disturbance
- Property Boundary

Paper Size A4

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

Douglas Shire Council
Environmental Approvals Supporting Report

Job Number 42-19890
Revision A
Date 13 Jun 2017

Project and Tidal Works Extent

Figure 3

G:\42\19890\GIS\Maps\MXD\42_19890_001_rev_a.mxd

145 Ann Street Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E brmail@ghd.com W www.ghd.com

3.3 Ecological Values

3.3.1 Protected Flora

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool identifies 24 flora species as potentially occurring of having habitat within 5 km of the Project. The EHP Wildlife Online search identified the following protected species as previously being recorded within 5 km of the project:

- *Mesua larnachiana* identified as vulnerable under the *Nature Conservation Act 1999* (NC Act)
- *Peripentadenia phelpsii* identified as vulnerable under the NC Act
- *Dioclea hexandra* identified as vulnerable under the NC Act
- *Toechima pterocarpum* (orange tamarind) identified as endangered under the EPBC Act and the NC Act.

In addition to the above, EHP maps the Project as occurring within a high risk area under the Protected Plants Flora Survey Trigger Map. Therefore, the works area and buffer area was surveyed for protected flora species in accordance with the provisions of the NCA *Flora Survey Guidelines – Protected Plants* by an EHP accredited botanist. No protected flora species were identified and subsequently an application for an exemption for protected plant clearing permit has been prepared and will be lodged to EHP/PALM independent of this application.

3.3.2 Marine Plants

An ecological survey was undertaken by a Principal Ecologist on the 16th February 2017. Due to the tidal nature of the rivers, the Project footprint was surveyed to determine if marine plants where present. The vegetation encountered on site was riparian vegetation only, no marine plants where identified in the field. Therefore, there are no direct impacts to marine plants proposed. Indirect impacts from water quality aspects will be required to be managed (refer to 3.2.1).

Plate 5: Riparian margins in South Mossman river, no marine plants

Plate 6: Riparian margins in Mossman River, no marine plants

3.3.3 Regulated Vegetation

The Department of Natural Resources and Mines (DNRM) map the Project footprint as occurring within Category R, reef-regrowth watercourse vegetation, refer to Figure 4. The following observations arising from the inspection were made:

- The vegetation is primarily advanced rainforest regrowth, dominated along the Mossman River embankment by introduced bamboos, and along the South Mossman River characterised by riparian regrowth and large non-native rain-trees.
- The shallow rooted nature of the rain trees on the South Mossman River has resulted in very poor soil retention and provides very limited natural slope stability by comparison with native deep rooted species typical of that area (e.g. black beans). One tree in particular on the embankment is exacerbating scouring problems in this regard and will need to be removed.
- Dense bamboo regrowth has been planted along the scoured slope along the Mossman River immediately adjacent the MWTP outfall. Gravel has been used to infill scour and erosion areas along the top of the bank that have destabilised the security fence. These areas will need to be cleared for construction.

The project will require clearing of 2,230 m^2 of mapped regulated Category R reef regrowth watercourse vegetation on the South Mossman River and 1,820 m^2 of mapped regulated Category R reef regrowth watercourse vegetation on the Mossman River. As mentioned, the vegetation in these areas has been previously impacted by erosion and minor stability works, therefore the overall direct impact to Category R vegetation is considered to be minor.

The western site is adjacent to mapped Category B vegetation, this vegetation is primarily associated with the opposite bank of the Mossman River. The regulated vegetation contains endangered regional ecosystems and as such is important to minimise impact. Therefore, the Contractor will be instructed to remain outside the boundaries of this vegetation, refer to Figure 4.

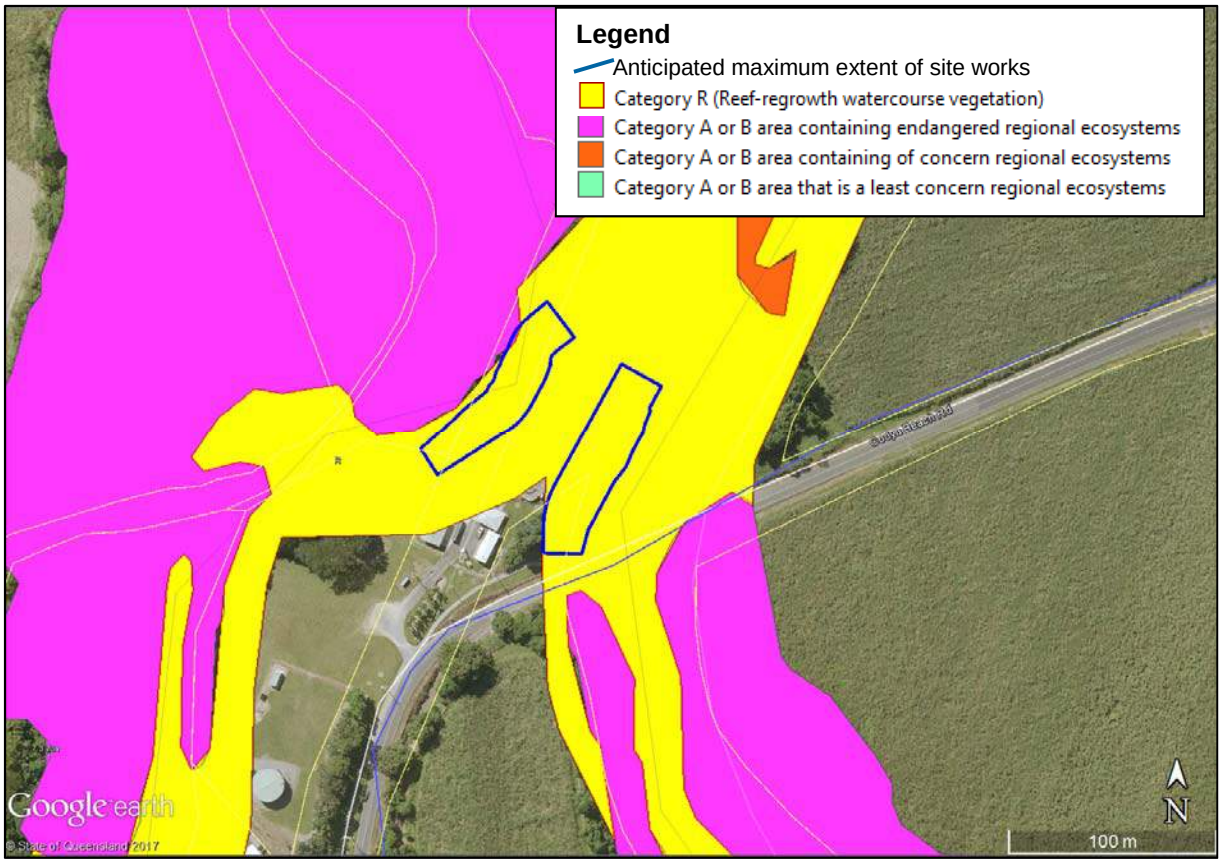


Figure 4: Regulated Vegetation Mapping

(Source: State of Queensland, Queensland Globe)

3.3.4 Protected Fauna

The EPBC Act Protected Matters Search Tool identifies 37 protected fauna species as potentially occurring within 5 km of the Project. The EHP Wildlife Online database search for a 5 km radius identified the following records:

- A number of special least concern fauna (32 of which 31 are migratory species)
- Two endangered fauna species
- Three vulnerable species.

This search radius included Mossman Gorge and the Daintree National Park located 3 km west of the Project, wherein most of the records were obtained. Ecological surveys (both terrestrial and aquatic) of the project works area were undertaken by a suitably qualified ecologist for this project. The project area has been heavily modified through previous clearing, introduction of exotic species, prior occupation and earth slips. No threatened or iconic species were located within the project area and it considered that that owing to the condition of the habitat available that any visitation would be opportunistic and transient.

3.3.5 Aquatic Ecology

The works will consist of placing of rockfill on the banks of the Mossman and South Mossman Rivers laterally and will include the toe of the rockfill intruding into the bed of the rivers. It is estimated that the rockfill toe of the South Mossman River revetment wall will extend into the bed of the river varying from the base of the bank (i.e. not into the river bed) to a maximum of 2.8 m. The rockfill toe of the

revetment wall on the Mossman River will extend to a maximum of 1 m into the bed of the river. These roc fill toe extensions provide only a partial barrier with the toe drowned out entirely during all flow events. The proposed construction will continue to allow fish passage upstream and downstream of the development and will not have any quantifiable impact on fisheries resources.

The Mossman River comprises an anastomosing reach of up to 230 m wide containing three channels, all of which provide for low flow conditions. There is a stream gauge on the Mossman River (531063) upstream of this reach and observation from the station indicate the Mossman River always maintains a base low flow, even during the dry season. The revetment works on the Mossman River partially extend onto the bed of the anabranch closest to the toe of the MWTP bank. Flow velocity calculations as part of the design criteria have identified that these works would not result in a measurable increase in low flow velocities at this point. At higher flows there will be no impacts and catadromous fish (and others in general) will not have to expend any additional energy reserves in migrating/moving upstream.

The South Mossman River revetment works will extend to a maximum of 3 m into the bed of the river. Flow velocities on the South Mossman River are largely determined by downstream tidal influences, although at this location direct tidal fluctuations are limited. At low flow events, (i.e. dry season) the river may have no determinable flow on a flood or neap tide, with flows only on an outgoing tide. It is anticipated that construction in the river bed by the revetment works will increase flows by up to 20% above the low flow. While this represents a significant flow increase based on percentage, in practical flow terms this is still a very low flow. At higher flows the impact of the revetment wall on flow velocities will be negligible.

Functional fish groups observed (and known to occur) within this reach include eels, grunters, gobies/gudgeons, barramundi. Swimming/velocity data (Pusey et al 1995, Pusey and Kennard 1994, Bishop et al 2001) indicate that these groups have a very wide range of flow habitats, with migration occurring outside of low flow periods (i.e. lead up to the wet season), during periods when the revetment walls will not have a significant impact on flow velocities. The revetment does not impose any constraint on fish species in terms of depleting energy resources for breeding or passage/movement. The construction works will take place during low flow periods in the dry season August to September/October when the majority of the observed and known fish taxa in these rivers are not migrating.

It should also be noted that for the Mossman River the works will impede on only one of the three anabranches of the Mossman River in this reach, and the other branches (within a total river bed width of approximately 230 m) will not be impacted at all by these construction works and passage for these channels will remain entirely unimpeded.

3.4 Protected Areas

Review of the Project location and available government databases indicates that the project is not within or in proximity to any protected areas including:

- Fish habitat areas
- Nation parks or other protected area estates
- Nature refuges or Koala Bushland Habitat
- Great Barrier Reef Marine Park
- Wet Tropics World Heritage Area
- Wetlands on the Map of Referable Wetlands and Vegetation Management Wetlands.

4. Review of Legislation

4.1 Legislative Review

Table 4 provides a summary of Commonwealth and State environmental and planning legislation and their applicability to the Project. Further details of the assessable development relevant to this application, i.e. those triggered under the *Sustainable Planning Act 2009* (SP Act), are provided following this table.

Table 4: Summary of Applicable Legislation

Legislation	Responsible Authority	Activity	License / Permit / Approval
Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)	Department of Environment	Action that has, will have, or is likely to have a significant impact on any of the Matters of National Environmental Significance (MNES).	**Not applicable** Based on a desktop assessment it is unlikely that the project will have significant impact upon MNES.
Aboriginal Cultural Heritage Act 2003	Department of Aboriginal and Torres Strait Islander and Multicultural Affairs	Require those conducting activities in areas of significance to take all reasonable and practical measures to avoid harming cultural heritage.	**Generally applicable** The search of the Aboriginal Cultural Heritage Database and Register did not identify and values or sites in proximity. Duty of care Guidelines to be complied with (e.g. consultation with local Aboriginal Party and cease work if items found).
Coastal Protection and Management Act 1995	Department of Environment and Heritage Protection (EHP)	Works that are tidal works	**Applicable** Works are in a Coastal Management District (CMD). South Mossman River is considered to be tidally influenced. Prescribed tidal works approval will be required. Refer to this application.
		Works where interfering with quarry material on state land above the high water mark occurs.	**Applicable** The revetment works involve interfering with soils and material located above the high water mark on state land (i.e. road reserve and waterway). Refer to this application.
		Works where removal of quarry material from land below the high-water mark occur.	**Not applicable** It is considered that the works within the rivers will not meet the requirements of tidal water as per the definition provided within the EHP Guideline – Allocation of quarry material.

Legislation	Responsible Authority	Activity	License / Permit / Approval
Environmental Protection Act 1994	EHP	Where 'serious and material environmental harm' is caused or threatened.	**Generally applicable** Duty of Care and Duty to Notify.
		Requiring Environmentally Relevant Activities (ERAs) (prescribed activities are generally industrial activities but also include some agricultural activities) to be licenced.	**Not applicable** No approvals and amendments for ERAs anticipated for the works associated with this Project.
Fisheries Act 1994	Department of Agriculture and Fisheries	Works within waterways that involve erecting a barrier to fish movement across a watercourse.	**Applicable** Development approval for waterway barrier works is triggered. Refer to this application.
		Works that involve the removal, destruction or damage of marine plants.	**No application** A site survey has identified that no marine plants are within the Project footprint.
Native Title Act 1993 (Commonwealth) *Native Title (Queensland) Act 1993*	Department of Natural Resources and Mines	Suppression of Native Title Rights and Interests that is inconsistent with the riverbank stabilisation works.	**Applicable** The South Mossman River waterway tenure is subject to Native Title.
Nature Conservation Act 1992	Department of Environment and Heritage Protection	Removal or disturbance of protected flora.	**Not applicable** A flora survey was undertaken and no protected flora species were identified in Project footprint. An exemption notification is being sought separately.
		Disturbance to animal breeding places	**Applicable** No protected fauna species habitat was observed, however least concern animal breeding places (such as bird nests) may be within the Project footprint. A fauna spotter catcher will be required for clearing works.
Queensland Heritage Act 1992	Department of Environment and Heritage Protection	Works associated with places registered under the Act. Incidental discovery of artefacts and their protection.	**Not applicable** No places identified in the desktop search.
State Development and Public Works Organisation Act 1971	Department of State Development, Infrastructure and Planning	Only applicable to works deemed state significant under the Act.	**Not applicable** This project is not a state significant project.

Legislation	Responsible Authority	Activity	License / Permit / Approval
Sustainable Planning Act 2009 *Sustainable Planning Regulation 2009*	Department of State Development, Infrastructure and Planning	Provides legislative framework for assessment process.	**Applicable** The project requires operational works approval for triggers identified in the Sustainable Planning Regulation 2009. Refer to this application/ report.
Transport Infrastructure Act 1994	Department Transport and Main Roads	Work within, in relation to or within 25 m of road reserves or rail land.	**Not applicable** No portions of land associated with this Project are within 25 m of a state-controlled road corridor (the closest is the Captain Cook Highway >400 m west of the Project) or rail land.
Vegetation Management Act 1999	Department of Natural Resources and Mines	Clearing of native vegetation.	**Not applicable** Mapped Category R vegetation will be cleared as part of these works. Clearing within the road reserve is considered exempt. Clearing within adjoining freehold parcels is considered exempt.
Water Act 2000	Department of Natural Resources and Mines	Destroy vegetation, excavate or place fill in a watercourse. Taking or interfering with water flow.	**Applicable** Mossman River and South Mossman river are defined as watercourses. Works to occur in accordance with the Riverine Protection Permit Exemption Requirements. No works proposed for the extraction of water.

4.2 Sustainable Planning Act 2009

4.2.1 Approval Trigger

The SP Act is the principal planning legislation for Queensland and set outs the integrated development assessment system (IDAS). IDAS is applicable for all assessable development under local government planning schemes and other State legislation rolled into the IDAS system. Assessable development under the SP Act can be either exempt, self-assessable, code assessable or impact assessable.

Pre-lodgement Advice

Pre-lodgement advice, reference SPL-1216-035975, was received from SARA.

Landowner Consents

Pursuant to section 263 of the SP Act, landowner consent is required for tidal works. As identified, it is considered that only works within the South Mossman river are tidal works, as such land owners consent is required from DNRM (on behalf of the State of Queensland) for works on a road reserve and waterway/esplanade tenure. Landowner consent is in the process of being finalised, refer to Appendix A.

IDAS Approvals

Development approval triggers under SP Act that are relevant to this Project include:

- SP Reg Schedule 3, Table 4, Item 5 Operational works that is:
  - Tidal works
  - Interfering with quarry material as defined under the Coastal Protection and Management Act on State coastal land above high water mark.
- SP Reg Schedule 3, Table 4, Item 6 Operational work that is the constructing or raising of waterway barrier works, other than operations work that is self-assessable development under part 2 or carried out on premises to which structure plan arrangement apply.

Assessment Manager and Referral Agencies

The Assessment Manager is identified as DSC with SARA acting as the primary referral agency.

4.2.2 Assessment of Relevant Legislation (where SP Act Triggers Apply)

Coastal Management and Protection Act 1995

The Coastal Act provides for the protection and management of coastal resources. The Act requires certain approvals to be sought for activities that are coastal in nature. Works on land subject to tidal inundation are assessable development. As mentioned in Section 3.2.3, review of the characteristics of the sites indicates that:

- The revetment wall on the Mossman River (west of the MWTP), one of three anabranches, does not display any tidal characteristics, for example no marine plants or other aquatic indicators. Therefore, works are not considered tidal.
- The revetment wall on the South Mossman River (east of the MWTP), is influenced by the tides, including flow levels/volumes. Although there were no significant marine plants identified, other aquatic factors where.

Therefore, prescribed tidal works approval is being sought.

In addition, sections of the Project on state land and part of the coastal management district, therefore Coastal Act is required to be considered. Under the SP Reg Schedule 3, Part 1, Table 4, Item 5(b)(i) carrying out operational work on State coastal land above high water mark, completely or partially within a coastal management district involving interference with a quarry material is assessable development.

Fisheries Act 1994

The Fisheries Act, administered by DAF protects fish habitat, which includes marine plants and intertidal habitat. The Fisheries Act requires approvals be sought for certain works in declared fish habitats, regulates fish passage by requiring applications for waterway barrier works and requires permits for the damage, removal, pruning or trimming of marine plants under the SP Act. As mentioned, the flora survey identified that no marine plants are present at both sites on the Mossman and South Mossman Rivers.

However, both rivers are mapped as major risk of impact waterways for the purpose of waterway barrier works. Therefore, development permit for Operational Works for constructing or raising waterway barrier works is required for the project in accordance with Schedule 3, Part 1, Table 4, Item 6 of the SP Reg. The works involve riverbank stabilisation, which includes filling of a section of the waterway and installing of revetment works consisting of rockfill.

Temporary works will be required within the waterways for erosion and sediment control, and potential for access (such as floating working platforms). As the details of such works are not yet known, the Contractor will be required to implement works in accordance with the DAF Code for self-assessable development: Temporary waterway barrier works (WWBW02).

Vegetation Management Act 1999

The *Vegetation Management Act 1999* (VM Act) regulates vegetation clearing and applies to all tenures. The VM Act seeks to regulate the clearing of native vegetation to preserve remnant regional ecosystems, vegetation in areas of high nature conservation values and areas vulnerable to land degradation.

As per Section 3.3.3, the site is mapped as Category R, reef regrowth watercourse vegetation.

Schedule 24 of the SP Reg identifies where certain clearing activities are non-assessable, i.e. exempt from requiring development approval. There are three types of tenure impacted by the Project. An assessment of applicable exemptions is provided as follows:

- Road reserve: exempt as per Schedule 24, Part 2, Item 5(e) – necessary to maintain infrastructure located on the road other than fences
- Freehold tenure: exempt as per Schedule 24, Part 2, Item 2(c) – necessary for essential management
- Waterway tenure / unallocated state land: exempt as per Schedule 24, Part 2, Item 7(a) – necessary for essential management (or Schedule 24, Part 2, Item 7(d).

5. Management Measures

5.1 During Construction

5.1.1 Environmental Management Plan

The Contractor will be required to implement an Environmental Management Plan (EMP) for the site. A preliminary EMP has been prepared by GHD. This EMP is to be utilised by the Contractor to form the basis of their EMP. A copy of the preliminary EMP is provided in Appendix F.

5.1.2 Erosion and Sediment Control Plan

The Contractor is required to plan and carry out work to avoid erosion, contamination, and sedimentation of the Project footprint, surrounding areas and drainage systems.

The necessary measures to avoid erosion include, where applicable, consideration of the following:

- Staging of operations
- Progressive restoration of disturbed areas
- Temporary drains and catch drains
- Diversion and disposal of concentrated flows to points where water can pass through the site without damage
- Construction and maintenance of silt fences, silt traps or detention basins to prevent discharge of secured material to downstream areas.
- Temporary grassing, contour ploughing or other treatment measures to disturbed areas.

As part of the Construction Contract, an erosion and sediment control plan shall be prepared by a suitably qualified person and submitted to the Superintendent as part of the Contractor's EMP prior to commencement of works.

The Contractor shall inspect, clean, and repair all Temporary Works for erosion and sediment control. Prior to completion of the works, the Contractor shall remove and make good all areas used for Temporary Works for erosion and sediment control to the standard and shape existing before commencement of the works.

5.1.3 Acid Sulfate Soils

Following vegetation clearance but prior to commencement of bulk earthworks, the Superintendent shall arrange for acid sulfate soil sampling and laboratory testing of natural soils which will be subject to excavation from below the long-term river water levels. The results of the testing will be provided to the Contractor within 2 weeks of the sampling date.

As set out in the Bill of Quantities, Contractor shall provide the following tender rates:

- A separate rate (per m^3) for excavation and disposal of materials identified as acid sulfate soil under the Queensland Acid Sulfate Soils Technical Manual. The tendered rate should assume stockpiling and liming at a rate of 0.3% (by weight) with pure fine $CaCO_3$;

Supply (per tonne) of pure fine $CaCO_3$ in the event that required liming rates exceed 0.3% by weight. The presence of acid sulfate soils will be carefully monitored during construction and the Contractor will be responsible for adhere to the EMP with respect to water quality, acid sulfate soils and erosion and sediment control.

Should high risk conditions be identified during construction, this represents a project hold point, during which an Acid Sulfate Soil Management Plan will be prepared in accordance with the Queensland Acid Sulfate Soils Technical Manual[4].

5.1.4 Rehabilitation

A detailed revegetation program is not proposed for these works as the rock revetment walls are not designed to support vegetation. However, upon completion of works the Contractor will re-establish the site outside of the direct project footprint where possible, this is likely to include grassing of areas where appropriate and allowing natural regrowth. The Contractor will also be responsible for site tidy up in accordance with legislative and DSC requirements.

5.2 During Operation / Maintenance

Routine inspections will be undertaken by DSC as part of the MWTP operation. If an issue is noted, such as erosion or rock wall failure, it will be reported and corrective action will be taken when appropriate. Where works are required, these will be undertaken in accordance with DSC environmental procedures. Where a risk assessment identifies a high potential for environmental impact controls are likely to be implemented in accordance with a site specific EMP.

[4] Queensland Government (2014) – Queensland Acid Sulfate Soil Technical Manual, Version 4.0

6. Assessable Development and Documentation

6.1 Assessment against the State Development Assessment Provisions (SDAP)

Responses to the relevant State Development Assessment Provisions are required. The following provides the assessment of the relevant SDAPs.

Note, review of the SP Reg, schedule 7, table 2, item 15 indicates that as works are not tidal works than completion of Module 14 Maritime Safety is not required. Due to the works being on river banks that are not navigable waterways Module 14 has not been completed.

6.1.1 Module 5: Fisheries Resources

Module 5 relates to Fisheries Resources and Module 5.2 - Constructing or raising waterway barrier works in fish habitats state code is applicable to the proposed works.

Activities associated with the proposed riverbank stabilisation works have been assessed against Module 5.2 and it is considered that the development achieves the purpose and generally complies with the Performance Outcomes and Acceptable Outcomes specified in the state code.

A detailed assessment of the proposed development against the applicable SDAP codes is provided in Appendix D.

6.1.2 Module 10: Coastal Protection

Module 10 relates to Coastal Protection and is applicable to the proposed works.

Activities associated with the proposed riverbank stabilisation works have been assessed against Module 10 and it is considered that the development achieves the purpose and generally complies with the Performance Outcomes and Acceptable Outcomes specified in the state code.

A detailed assessment of the proposed development against the applicable SDAP codes is provided in Appendix D.

6.2 Assessment against the Prescribed Tidal Works Code

The purpose of this code is to ensure prescribed tidal work for which it applies—

a. is compatible with the character and amenity of its surrounding area; and

b. is designed and constructed in a way to ensure it is structurally sound; and

c. is safe for use; and

d. is adequately serviced with infrastructure, including, for example, infrastructure for the supply of water or the discharge of sewage; and

e. involves only minimal use of tidal water in a canal, for a non-maritime purpose; and

f. does not cause a significant adverse affect to any of the following—

   i. existing public access to any foreshores or any tidal water;

   ii. navigable access to, or navigable egress from, any non-tidal work lot;

iii. the natural features of any tidal water, including, for example, the water quality and bed and banks of the tidal water;

iv. the structural integrity, operation or maintenance of any existing structure.

Activities associated with the proposed development have been assessed against Schedule 4A of the *Coastal Protection and Management Regulation 1995* and it is considered that the development achieves the purpose and generally complies with the Specific Outcomes and Probable Solutions specified in the code. A detailed assessment of the proposed development against the prescribed tidal works code is provided in Appendix E.

7. Conclusions and Recommendations

This development application seeks approval for MWTP riverbank stabilisation works, which involves effective and affordable RPEQ approved engineering design and construction of necessary riverbank stabilisation works adjacent to the existing MWTP.

A Development Approval is sought for works involving the following:

- Operational work that are tidal works
- Operational work for interfering with quarry material on State land above the high water mark
- Operation work that is waterway barrier works.

Activities associated with the proposed works have been assessed against the relevant State Development Assessment Provisions (SDAP). It is considered that the proposed development achieves the intent and generally complies with the Performance Criteria / Outcomes specified in the planning codes and guidelines.

Assessment of the proposal under relevant legislation identifies the project as meeting these requirements through implementation of preventative mitigation measures and best practice techniques to be identified in an Environmental Management Plan (EMP).

In summary, this Environmental Approvals Supporting Report provides information to assist in the processing of the Development Approval. Based on the assessment undertaken in this report it is concluded that the application could be approved by the Assessment Manager.

Appendices

Appendix A – Application Forms

- **IDAS Form 1: Application Details**
- **IDAS Form 23: Tidal works and development**
- **IDAS Form 27: Waterway barrier works**
- **Land Owners Consent (request)**

IDAS form 1—Application details

(*Sustainable Planning Act 2009* version 4.3 effective 5 December 2016)

This form must be used for **ALL** development applications.

You **MUST** complete **ALL** questions that are stated to be a mandatory requirement unless otherwise identified on this form.

For all development applications, you must:

- complete this form (*IDAS form 1—Application details)*
- complete any other forms relevant to your application
- provide any mandatory supporting information identified on the forms as being required to accompany your application.

Attach extra pages if there is insufficient space on this form.

All terms used on this form have the meaning given in the *Sustainable Planning Act 2009* (SPA) or the Sustainable Planning Regulation 2009.

This form and any other IDAS form relevant to your application must be used for development applications relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994* and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*. Whenever a planning scheme is mentioned, take it to mean land use plan for the strategic port land, Brisbane core port land or airport land.

PLEASE NOTE: This form is not required to accompany requests for compliance assessment.

Mandatory requirements

Applicant details (Note: the applicant is the person responsible for making the application and need not be the owner of the land. The applicant is responsible for ensuring the information provided on all IDAS application forms is correct. Any development permit or preliminary approval that may be issued as a consequence of this application will be issued to the applicant.)

Name/s (individual or company name in full)	**Douglas Shire Council**			
For companies, contact name	**C/o – Kylie Cauchi**			
Postal address	PO Box 819			
	Suburb	Cairns		
	State	Queensland	Postcode	4870
	Country	Australia		
Contact phone number	07 4022 2209			
Mobile number (non-mandatory requirement)				
Fax number (non-mandatory requirement)				

Email address (non-mandatory requirement)	Kylie.Cauchi@ghd.com
Applicant's reference number (non-mandatory requirement)	

1. What is the nature of the development proposed and what type of approval is being sought?

Table A—Aspect 1 of the application (If there are additional aspects to the application please list in Table B—Aspect 2.)

a) What is the nature of the development? (Please only tick one box.)

☐ Material change of use ☐ Reconfiguring a lot ☐ Building work ☒ Operational work

b) What is the approval type? (Please only tick one box.)

☐ Preliminary approval under s241 of SPA ☐ Preliminary approval under s241 and s242 of SPA ☒ Development permit

c) Provide a brief description of the proposal, including use definition and number of buildings or structures where applicable (e.g. six unit apartment building defined as a *multi-unit dwelling*, 30 lot residential subdivision etc.)

The river banks of the Mossman River on the northern boundary of the Mossman Wastewater Treatment Plant (MWTP) and the South Mossman River on the southern boundary of the MWTP have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. During and following significant rainfall events, slip scarps have been encroaching site boundary fences and buried services. Future progression of observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure.

Approximately 78 m of embankment on the South Mossman River and 75 m of embankment on the Mossman River systems are required to be reconstructed utilising geotech fabric and rockfill.

d) What is the level of assessment? (Please only tick one box.)

☐ Impact assessment ☒ Code assessment

Table B—Aspect 2 of the application (If there are additional aspects to the application please list in Table C—Additional aspects of the application.)

a) What is the nature of development? (Please only tick one box.)

☐ Material change of use ☐ Reconfiguring a lot ☐ Building work ☐ Operational work

b) What is the approval type? (Please only tick one box.)

☐ Preliminary approval under s241 of SPA ☐ Preliminary approval under s241 and s242 of SPA ☐ Development permit

c) Provide a brief description of the proposal, including use definition and number of buildings or structures where applicable (e.g. six unit apartment building defined as a *multi-unit dwelling*, 30 lot residential subdivision etc.)

d) What is the level of assessment?

☐ Impact assessment ☐ Code assessment

Table C—Additional aspects of the application (If there are additional aspects to the application please list in a separate table on an extra page and attach to this form.)

☐ Refer attached schedule ☒ Not required

2. Location of the premises (Complete Table D and/or Table E as applicable. Identify each lot in a separate row.)

Table D—Street address and lot on plan for the premises or street address and lot on plan for the land adjoining or adjacent to the premises (Note: this table is to be used for applications involving taking or interfering with water.) (Attach a separate schedule if there is insufficient space in this table.)

☐ Street address **and** lot on plan (All lots must be listed.)

☒ Street address **and** lot on plan for the land adjoining or adjacent to the premises (Appropriate for development in water but adjoining or adjacent to land, e.g. jetty, pontoon. All lots must be listed.)

Street address					**Lot on plan description**		**Local government area** (e.g. Logan, Cairns)
Lot	Unit no.	Street no.	Street name and official suburb/ locality name	Post-code	Lot no.	Plan type and plan no.	
i)			Junction Rd Reserve	4873			Douglas Shire Council
ii)			South Mossman River Esplanade	4873			Douglas Shire Council
iii)					24	RP800895	Douglas Shire Council
iv)					26	RP804231	Douglas Shire Council
v)					22	RP800895	Douglas Shire Council

Planning scheme details (If the premises involves multiple zones, clearly identify the relevant zone/s for each lot in a separate row in the below table. Non-mandatory)

Lot	Applicable zone / precinct	Applicable local plan / precinct	Applicable overlay/s
i)	Road reserve	Mossman and Environs	Acid sulfate soil
ii)	Community and recreational	Mossman and Environs	Acid sulfate soil
iii)	conservation	Mossman and Environs	Acid sulfate soil

Table E—Premises coordinates (Appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay.) (Attach a separate schedule if there is insufficient space in this table.)

Coordinates (Note: place each set of coordinates in a separate row)				**Zone reference**	**Datum**	**Local government area (if applicable)**
Easting	Northing	Latitude	Longitude			
E326818	N9190504	16°27'05"	145°22'37''	MGA Zone 55	☒ GDA94 ☐ WGS84 ☐ other	Douglas Shire Council

3. Total area of land on which the development is proposed (indicate square metres)

2,230 m^2 on South Mossman River (revetment works disturbance area – max 93 m in length and 25 m in width)
1,820 m^2 on Mossman River (revetment works disturbance area – max 95 m in length and 22 m in width)

4. Current use/s of the premises (e.g. vacant land, house, apartment building, cane farm etc.)

Vacant Land.
Road Reserve and River Esplanade along Junction Road adjacent to Mossman Water Treatment Plant.

5. Are there any current approvals (e.g. a preliminary approval) associated with this application? (Non-mandatory requirement)

☒ No ☐ Yes—provide details below

List of approval reference/s	Date approved (dd/mm/yy)	Date approval lapses (dd/mm/yy)

6. Is owner's consent required for this application? (Refer to notes at the end of this form for more information.)

☐ No

☒ Yes—complete either Table F, Table G or Table H as applicable

Table F	
Name of owner/s of the land	
I/We, the above-mentioned owner/s of the land, consent to the making of this application.	
Signature of owner/s of the land	
Date	

Table G	
Name of owner/s of the land	**Department of Natural Resources and Mines**
☒ The owner's written consent is attached or will be provided separately to the assessment manager.	

Table H	
Name of owner/s of the land	
☐ By making this application, I, the applicant, declare that the owner has given written consent to the making of the application.	

7. Identify if any of the following apply to the premises (Tick applicable box/es.)

☒ Adjacent to a water body, watercourse or aquifer (e.g. creek, river, lake, canal)—complete Table I

☐ On strategic port land under the *Transport Infrastructure Act 1994*—complete Table J

☐ In a tidal water area—complete Table K

☐ On Brisbane core port land under the *Transport Infrastructure Act 1994* (No table requires completion.)

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008* (no table requires completion)

☐ Listed on either the Contaminated Land Register (CLR) or the Environmental Management Register (EMR) under the *Environmental Protection Act 1994* (no table requires completion)

Table I
Name of water body, watercourse or aquifer
Mossman River and South Mossman River.

Table J	
Lot on plan description for strategic port land	Port authority for the lot

Table K	
Name of local government for the tidal area (if applicable)	Port authority for the tidal area (if applicable)
Douglas Shire Council	

8. Are there any existing easements on the premises? (e.g. for vehicular access, electricity, overland flow, water etc)

☒ No ☐ Yes—ensure the type, location and dimension of each easement is included in the plans submitted

9. Does the proposal include new building work or operational work on the premises? (Including any services)

☐ No ☒ Yes—ensure the nature, location and dimension of proposed works are included in plans submitted

10. Is the payment of a portable long service leave levy applicable to this application? (Refer to notes at the end of this form for more information.)

☐ No—go to question 11 ☒ Yes

10a. Has the portable long service leave levy been paid? (Refer to notes at the end of this form for more information.)

☒ No

☐ Yes—complete Table L and submit, with this application, the local government/private certifier's copy of the accepted QLeave form

Table L		
Amount paid	Date paid (dd/mm/yy)	QLeave project number (6 digit number starting with A, B, E, L, P or S)

11. Has the local government agreed to apply a superseded planning scheme to this application under section 96 of the *Sustainable Planning Act 2009*?

☒ No

☐ Yes—please provide details below

Name of local government	Date of written notice given by local government (dd/mm/yy)	Reference number of written notice given by local government (if applicable)

12. List below all of the forms and supporting information that accompany this application (Include all IDAS forms, checklists, mandatory supporting information etc. that will be submitted as part of this application)

Description of attachment or title of attachment	Method of lodgement to assessment manager
IDAS Form 1, Form 23 and Form 27	Online / within Supporting Document
Douglas Shire Council MWTP Environmental Approvals Supporting Report.	Online
Douglas Shire Council MWTP Remedial Works EMP	Online / within Supporting Document
Detailed Design Drawings	Online / within Supporting Document

13. Applicant's declaration

☒ By making this application, I declare that all information in this application is true and correct (Note: it is unlawful to provide false or misleading information)

Notes for completing this form

- Section 261 of the *Sustainable Planning Act 2009* prescribes when an application is a properly-made application. Note, the assessment manager has discretion to accept an application as properly made despite any non-compliance with the requirement to provide mandatory supporting information under section 260(1)(c) of the *Sustainable Planning Act 2009*

Applicant details

- Where the applicant is not a natural person, ensure the applicant entity is a real legal entity.

Question 1

- Schedule 3 of the Sustainable Planning Regulation 2009 identifies assessable development and the type of assessment. Where schedule 3 identifies assessable development as "various aspects of development" the applicant must identify each aspect of the development on Tables A, B and C respectively and as required.

Question 6

- Section 263 of the *Sustainable Planning Act 2009* sets out when the consent of the owner of the land is required for an application. Section 260(1)(e) of the *Sustainable Planning Act 2009* provides that if the owner's consent is required under section 263, then an application must contain, or be accompanied by, the written consent of the owner, or include a declaration by the applicant that the owner has given written consent to the making of the application. If a development application relates to a state resource, the application is not required to be supported by evidence of an allocation or entitlement to a state resource. However, where the state is the owner of the subject land, the written consent of the state, as landowner, may be required. Allocation or entitlement to the state resource is a separate process and will need to be obtained before development commences.

Question 7

- If the premises is listed on either the Contaminated Land Register (CLR) or the Environmental Management Register (EMR) under the *Environmental Protection Act 1994* it may be necessary to seek compliance assessment. Schedule 18 of the Sustainable Planning Regulation 2009 identifies where compliance assessment is required.

Question 10

- The *Building and Construction Industry (Portable Long Service Leave) Act 1991* prescribes when the portable long service leave levy is payable.
- The portable long service leave levy amount and other prescribed percentages and rates for calculating the levy are prescribed in the Building and Construction Industry (Portable Long Service Leave) Regulation 2013.

Question 10a

- The portable long service leave levy need not be paid when the application is made, but the *Building and Construction Industry (Portable Long Service Leave) Act 1991* requires the levy to be paid before a development permit is issued.
- Building and construction industry notification and payment forms can be completed on the QLeave website at www.qleave.qld.gov.au. For further information contact QLeave on 1800 803 481.

Privacy—The information collected in this form will be used by the Department of Infrastructure, Local Government and Planning (DILGP), assessment manager, referral agency and/or building certifier in accordance with the processing and assessment of your application. Your personal details should not be disclosed for a purpose outside of the IDAS process or the provisions about public access to planning and development information in the *Sustainable Planning Act 2009*, except where required by legislation (including the *Right to Information Act 2009*) or as required by Parliament. This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002*.

OFFICE USE ONLY

Date received		Reference numbers	

NOTIFICATION OF ENGAGEMENT OF A PRIVATE CERTIFIER

To [ ] Council. I have been engaged as the private certifier for the building work referred to in this application

Date of engagement	Name	BSA Certification license number	Building classification/s

QLEAVE NOTIFICATION AND PAYMENT (For completion by assessment manager or private certifier if applicable.)

Description of the work	QLeave project number	Amount paid ($)	Date paid	Date receipted form sighted by assessment manager	Name of officer who sighted the form

The *Sustainable Planning Act 2009* is administered by the Department of Infrastructure, Local Government and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agency.

IDAS form 23—Tidal works and development within the coastal management district

(*Sustainable Planning Act 2009* version 3.1 effective 3 August 2015)

This form must be used for development applications for:

- operational work that is tidal works (including prescribed tidal works) or operational work within the coastal management district (mentioned in the Sustainable Planning Regulation 2009, schedule 7, table 2, item 13)
- material change of use that requires referral under the Sustainable Planning Regulation 2009, schedule 7, table 3, item 5 because it involves:
  - operational work carried out completely or partly in the coastal management district; or
  - building work carried out completely or partly in the coastal management district that is the construction of a new premises with a gross floor area (GFA) of at least 1000m^2 or the enlargement of the GFA of an existing premises by more than 1000m^2
- reconfiguring a lot that requires referral under the Sustainable Planning Regulation 2009, schedule 7, table 2, item 14 because the land is situated completely or partly in the coastal management district or the reconfiguration is in connection with the construction of a canal
- building work that requires referral under the Sustainable Planning Regulation 2009, schedule 7, table 1, item 11 because it is on land completely or partly seaward of a coastal building line.

You **MUST** complete **ALL** questions that are stated to be a mandatory requirement unless otherwise identified on this form.

Notes for completing this form

For all development applications you must:

- complete *IDAS form 1—Application details*
- complete any other forms relevant to your application
- provide any mandatory supporting information identified on the forms as being required to accompany your application.

Attach extra pages if there is insufficient space on this form.

All terms used on this form have the meaning given in the *Coastal Management and Protection Act 1995*, the Coastal Protection and Management Regulation 2003, the *Sustainable Planning Act 2009* (SPA) or the Sustainable Planning Regulation 2009.

Mandatory requirements

1. Confirm the following mandatory requirements accompany this application	**Confirmation of lodgement**	**Method of lodgement**
Written description of the proposal, including a report that addresses any relevant policies.	☒ Confirmed	Online / within Supporting Document

2. What is the nature of the work or development proposed by the application? (Tick all applicable boxes.)

☒ Operational work—complete table A

☐ Material Change of Use—complete table B

☐ Reconfiguring a Lot—complete table C

☐ Building Work—complete table D

Table A—Operational Work

Does the operational work involve the following? (Tick all applicable boxes.)

a) Tidal works as defined under the *Coastal Protection and Management Act 1995* (e.g. basins, breakwater, bridges, boat ramps, decks and boardwalks, docks, dockyards, groynes, jetties, marinas, pipelines, pontoons, powerlines, seawalls, slips, training walls, wharves and the reclamation of land under tidal water)?

☐ No ☒ Yes

If yes, what is the purpose?

Riverbanks adjacent to the Mossman Wastewater Treatment Plant (MWTP) have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. During and following significant rainfall events, slip scarps have been encroaching site boundary fences and buried services. Future progression of observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure.

☐ Private purpose (e.g. private pontoon)

☐ Another purpose (e.g. commercial marina)

Does the tidal works also require resource allocation under the *Coastal Protection and Management Act 1995*?

☒ No ☐ Yes

If applicable what is the estimated value of the proposed works?

b) Interfering with quarry material as defined under the *Coastal Protection and Management Act 1995* (e.g. excavating or moving sand, gravel or any other earth material on state coastal land such as roads, esplanades, parks or unallocated state land) on state coastal land above high-water mark.

☐ No ☒ Yes

If yes, which of the following?

☐ Works for coastal management purpose involving beach nourishment, dune fencing, revegetation of dunal areas with endemic native plants, or stinger net enclosures.

☐ For purposes directly related to the provision of lifesaving or rescue services by a volunteer community organisation.

☒ For other purposes (please state below).

Riverbank Stabilisation Works

If applicable what is the estimated value of the proposed works?

$2,020,000 (all works, not just tidal)

c) Disposing of dredge spoil or other solid waste material in tidal water?

☒ No ☐ Yes

If applicable what is the estimated value of the proposed works?

d) Constructing an artificial waterway?

☒ No ☐ Yes

If applicable what is the length of the waterway?

e) Removing or interfering with coastal dunes on land, other than state coastal land, that is in an erosion prone area as defined in the *Coastal Protection and Management Act 1995* and above high water mark (e.g. lowering dune vegetation on freehold and leasehold land)?

☒ No ☐ Yes

If applicable what is the estimated value of the proposed works?

Table B—Material change of use

a) Does the material change of use involve the following? (Tick all applicable boxes.)

☐ Operational work carried out completely or partly in the coastal management district

b) Does the material change of use involve building work carried out completely or partly in the coastal management district that is:

☐ the construction of new premises with a gross floor area of at least 1000 m^2

☐ the enlargement of the gross floor area of existing premises by more than 1000 m^2

Table C—Reconfiguring a lot

a) Does the reconfiguring a lot involve the following? (Tick all applicable boxes.)

☐ Land situated completely or partly in the coastal management district

☐ The construction of a canal

b) How many lots will be created?

Table D—Building work

a) Is the building work on land completely or partly seaward of the coastal building line under the *Coastal Protection and Management Act 1995*?

☐ No ☐ Yes

3. Is the tidal works located within a local government tidal area? (Tick all applicable boxes)

☐ No ☒ Yes—provide details below

Local government:	**Douglas Shire Council**

Mandatory supporting information

4. Please provide the following information	**Confirmation of lodgement**	**Method of lodgement**
For all applications		
A statement addressing the relevant part(s) of the State Development Assessment Provisions (SDAP).	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
For applications involving operational work that is tidal works		
A copy of the certificate of title for the land (including tidal land) that would abut or adjoin the proposed works.	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
Plans showing: • the real property description and boundaries of the land (including tidal land) that would abut or adjoin the proposed works • the proposed works (including existing works to be removed) in relation to relevant tidal planes (e.g. mean high water springs) • the slope angles of the beds and banks of the tidal area and the finished levels of the proposed works.	☒ Confirmed ☐ Not applicable	
For tidal work that will occupy a navigable waterway provide a water allocation area plan providing evidence that the proposed work will not prejudice the access rights of adjoining property owners.	☐ Confirmed ☒ Not applicable	

Details of the largest vessel, if any, to be moored at the structure.	☐ Confirmed ☒ Not applicable	
For prescribed tidal works, details of how the proposed work addresses the IDAS code for prescribed tidal work in the Coastal Protection and Management Regulation 2003, schedule 4A.	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
If applicable, certification that the design of tidal works is suitable for intended use, signed by a Registered Professional Engineer of Queensland (or equivalent).	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
For applications involving material change of use		
Plans certified by a registered professional engineer of Queensland (RPEQ) or a registered surveyor showing: • the real property description and boundaries of the land • the proposed works in relation to the location of the coastal management district and coastal hazards.	☐ Confirmed ☒ Not applicable	
For applications involving reconfiguring a lot		
Plans certified by a registered surveyor showing: • the real property description and boundaries of the land • The location of the coastal management district and coastal hazards in relation to the land being reconfigured • Any land being surrendered as a separate lot on the plan of subdivision.	☐ Confirmed ☒ Not applicable	
For applications involving building works seaward of a coastal building line		
Plans certified by a registered professional engineer of Queensland (RPEQ): • the real property description and boundaries of the land • the proposed works in relation to the location of the coastal building line.	☐ Confirmed ☒ Not applicable	

Notes for completing this form

- Please ensure all applicable fees are paid, noting that referral agency fees are to be paid to the Department of Environment and Heritage Protection.
- For an application requiring referral to the Department of Transport and Main Roads (DTMR), it is recommended that the applicant contact DTMR to ensure that required information for assessment of the application is provided.

Privacy—Please refer to your assessment manager, referral agency and/or building certifier for further details on the use of information recorded in this form.

OFFICE USE ONLY

Date received		Reference numbers	

The *Sustainable Planning Act 2009* is administered by the Department of Infrastructure, Local Government and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agency.

IDAS form 27—Waterway barrier works

(*Sustainable Planning Act 2009* version 3.2 effective 3 August 2015)

This form must be used for development applications for operational work that is the constructing or raising of waterway barrier works.

You **MUST** complete **ALL** questions that are stated to be a mandatory requirement unless otherwise identified on this form.

For all development applications you must:

- complete *IDAS form 1—Application details*
- complete any other forms relevant to your application
- provide any mandatory supporting information identified on the forms as being required to accompany your application.

Attach extra pages if there is insufficient space on this form.

All terms used on this form have the meaning given in the *Sustainable Planning Act 2009* (SPA), the Sustainable Planning Regulation 2009, the *Fisheries Act 1994* or the Fisheries Regulation 2008.

Mandatory requirements

1. Has a Fish Movement Exemption Notice been issued for the proposed work?

☐ Yes – submit with this application, a copy of the Fish Movement Exemption Notice for the proposed work.

☒ No – submit with this application, details of how the proposed work provides for adequate fish movement.

2. What is the nature of the proposed work? (Tick all applicable boxes.)

☐ Construction of a new waterway barrier/s

☒ Temporary waterway barrier/s

☒ Partial waterway barrier/s

☐ Raising an existing waterway barrier/s

☒ Permanent waterway barrier/s

☐ Bank to bank waterway barrier/s

3. What is the type of the proposed work? (Tick all applicable boxes.)

	Number of barriers
☐ Dam, weir or a barrage (complete section 4)	
☐ Culvert (complete section 5)	
☐ Causeway (complete section 6)	
☐ Bridge pylon (abutments or pile foundations) (complete section 6)	
☐ Flow control structure such as a floodgate (complete section 6)	
☐ Pollution control device such as trash rack or a boom gate (complete section 6)	
☐ Levee bank across a waterway (complete section 6)	
☒ Other—please specify (e.g. groyne, construction platform, sediment curtain, causeway) (complete section 6)	Number of barriers
Revetment Walls	2 permanent: revetment walls.

4. Constructing a new or raising an existing dam, weir, barrage, bund wall, coffer dam or other similar structures

The application is seeking approval for: ☐ new barrier ☐ raising of an existing barrier

Briefly describe the type of barrier proposed (i.e. dam, weir, tidal barrage, etc.)

For a temporary barrier (i.e. in place less than 12 months), how many days will the barrier be in place? _____ days

Will the barrier extend across the waterway from bank to bank?

☐ Yes

☐ No – how long is the proposed barrier (across the waterway)? _____ metres

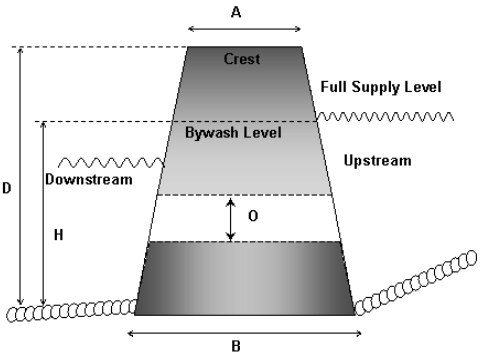
– how wide is the waterway (bank to bank)? _____ metres

What is the purpose of the proposed barrier? (E.g. creating a new or increasing the capacity of the existing water storage, maintenance work, etc.)

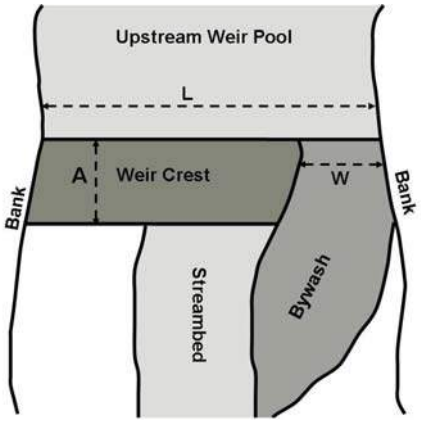
What are the details of the proposed construction materials? (E.g. earth, concrete, rock fill, steel, timber, sand, etc.)

Please refer to the attached Design Report (GHD 2017) for details of construction materials and construction generally. Construction materials will be reinforced rock fill with geotextile.

In reference to the diagrams below, provide the following details of the proposed barrier:



Cross section of barrier



Aerial view of waterway

• total crest height (D)		metres
• thickness (A) of crest		metres
• height of spillway / bywash (H)		metres
• width of spillway / bywash inlet (W)		metres
• base width (B)		metres
• internal diameter (O) of outlet pipe/works and discharge capacity		milli-metres
• length of wall (L)		metres
• distance of backup from barrier wall at full supply level		metres
• volume of storage.		mega-litres
• If raising an existing waterway barrier:		
- additional height above existing crest		metres

- method of raising (e.g. capping crest, inflatable bag, gates etc.).

Does the application involve more than one barrier addressed by this section?

☐ Yes - generate another section 4 response for each barrier and submit with the application.

☐ No - if the application involves another type of barrier identified in section 3, go to the relevant section identified.

- if the application does not involve another type of barrier identified in section 3, go to section 7.

5. Constructing a new or modifying (including maintenance and replacement of) an existing culvert

What is the nature of the proposed work?

- ☐ Construction of a new culvert
- ☐ Maintenance of an existing culvert
- ☐ Replacement of an existing culvert

What is the purpose of the proposed culvert?

For a temporary barrier (i.e. in place less than 12 months), how many days will the culvert be in place? _____ days

Will the culvert extend across the waterway from bank to bank?

- ☐ Yes
- ☐ No
  - how long is the proposed culvert (across the waterway)? _____ metres
  - how wide is the waterway (bank to bank)? _____ metres

What type of culvert is proposed?

- ☐ Box culvert
- ☐ Arch culvert
- ☐ Pipe culvert
- ☐ Combination culvert
- ☐ Other—please specify: _____

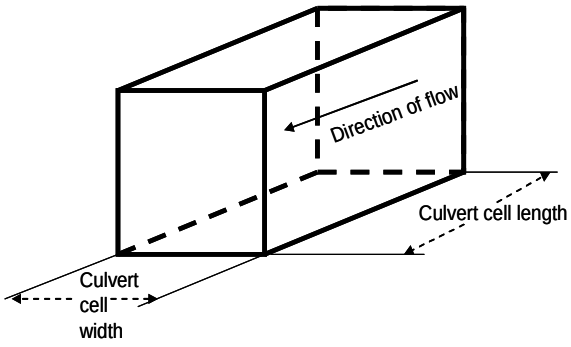
In reference to the diagrams below, provide the following details of the proposed culvert.

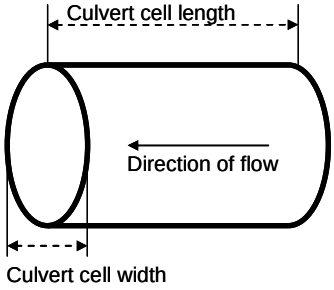
How many culvert cells are there? _____

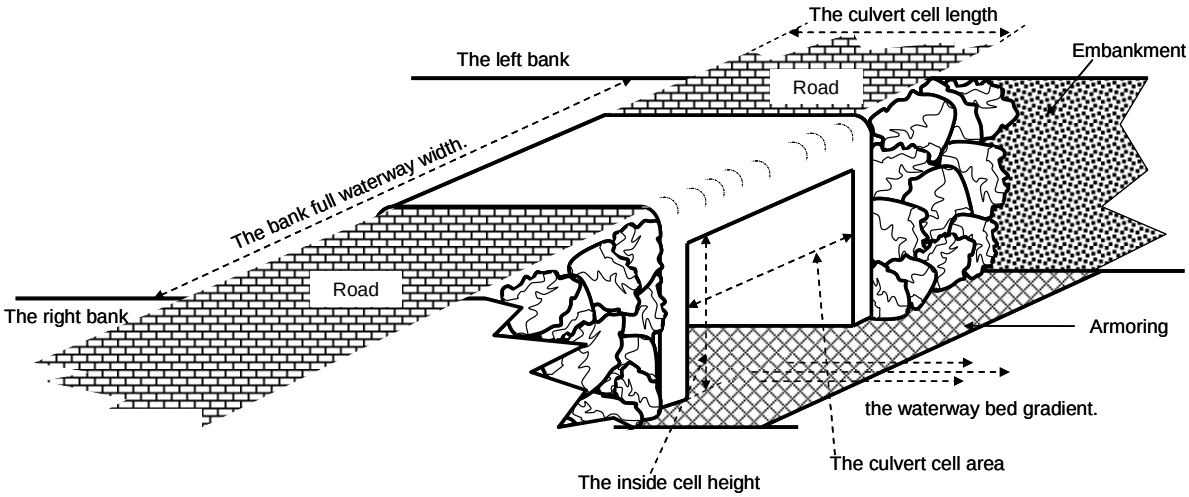
What is the upstream downstream culvert cell length? _____ metres

What is the inside cell width of each culvert (or diameter of pipe culvert)? _____ metres

What is the internal height within the culvert cell? _____ metres







Does the application involve more than one culvert?

☐ Yes - generate another section 5 response for each culvert and submit with the application.

☐ No - if the application involves another type of barrier identified in section 3, go to the relevant section identified.

- if the application does not involve another type of barrier identified in section 3, go to section 7.

6. Constructing a new or modifying (including maintenance and replacement) an existing waterway barrier except those listed in sections 4 and 5.

What is the nature of the proposed work?

☒ Construction of a new barrier

☐ Replacement of an existing barrier

☐ Maintenance of an existing barrier

Briefly describe the proposed barrier.

Rock revetment wall. Approximately 78 m of embankment on the South Mossman River.

For a temporary barrier (i.e. in place less than 12 months), how many days will the barrier be in place? _____ days

Will the barrier extend across the waterway from bank to bank?

☐ Yes

☒ No - how long is the proposed barrier (across the waterway)? _____

- how wide is the waterway (bank to bank)? _____ metres

What is the purpose of the proposed barrier?

River banks adjacent to the Mossman Wastewater Treatment Plant (MWTP) have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. During and following significant rainfall events, slip scarps have been encroaching site boundary fences and buried services. Future progression of observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure

What is the maximum height of the proposed barrier above the existing bed level? 11 metres

What are the proposed construction materials? (E.g. earth, concrete, rock fill, steel, timber, sand, etc.)?

Geosynthetic fabric underlay and rockfill.

Does the barrier follow the natural gradient of the bed level?

☒ Yes

☐ No

Does the application involve more than one barrier under this section?

☐ Yes - generate another section 6 response for each barrier and submit with the application.

☐ No - go to section 7.

6. Second Barrier Response

What is the nature of the proposed work?

☒ Construction of a new barrier

☐ Replacement of an existing barrier

☐ Maintenance of an existing barrier

Briefly describe the proposed barrier.

Rock revetment wall. Approximately 75 m of embankment on the Mossman River systems are required to be reconstructed utilising geosynthetic fabric and rockfill.

For a temporary barrier (i.e. in place less than 12 months), how many days will the barrier be in place? _____ days

Will the barrier extend across the waterway from bank to bank?

☐ Yes

☒ No - how long is the proposed barrier (across the waterway)? _____

- how wide is the waterway (bank to bank)? _____ metres

What is the purpose of the proposed barrier?

River banks adjacent to the Mossman Wastewater Treatment Plant (MWTP) have been subject to ongoing instability and slope failure due to the slopes regressing over the past ten years. During and following significant rainfall events, slip scarps have been encroaching site boundary fences and buried services. Future progression of observed bank instability may place key MWTP structures at risk of serviceability loss or structural failure

What is the maximum height of the proposed barrier above the existing bed level? 10 metres

What are the proposed construction materials? (E.g. earth, concrete, rock fill, steel, timber, sand, etc.)?

Geosynthetic fabric underlay and rockfill.

Does the barrier follow the natural gradient of the bed level?

☒ Yes

☐ No

Does the application involve more than one barrier under this section?

☐ Yes - generate another section 6 response for each barrier and submit with the application.

☐ No - go to section 7.

Mandatory supporting information

7. Confirm the following mandatory supporting information accompanies this application.

Mandatory supporting information	**Confirmation of lodgement**	**Method of lodgement**
Location details for all applications		
A scale map/sketch plan of the site and the neighbouring area identifying: • the site of the proposed works on the waterway • the names of the waterway and the catchment in which the waterway is located • stream order • where the (site) waterway joins with another, more major waterway (or coastal waters) downstream • other easily identifiable geographical features adjacent to the proposed works • the limit and area of impounded waters (upstream weir pool) at full supply level (if relevant).	☒ Confirmed	Online / within Supporting Document
GPS coordinates and zone references of the works site (GDA94 preferred).	☒ Confirmed	Online / within Supporting Document
Photographs of the site and the waterway upstream and downstream of the works site.	☒ Confirmed	Online / within Supporting Document

A scale plan showing the limit of and area of impounded waters at full supply level.	☒ Confirmed	Online / within Supporting Document
Details of the proposed development for all applications		
Justification and the benefits of the proposed waterway barrier works.	☒ Confirmed	Online / within Supporting Document
Assessment of lesser impact alternatives and reasons for the proposed waterway barrier.	☒ Confirmed	Online / within Supporting Document
Details of the proposed waterway barrier.	☒ Confirmed	Online / within Supporting Document
Details of the structure and management of the impoundments.	☒ Confirmed	Online / within Supporting Document
Details of the proposed maintenance program on the waterway barrier after construction.	☒ Confirmed	Online / within Supporting Document
A statement addressing the relevant part(s) of the State Development Assessment Provisions (SDAP).	☒ Confirmed ☐ Not applicable	Online / within Supporting Document
Details of the waterway for all applications		
A scaled plan showing a cross-section of the stream profile at the proposed location.	☒ Confirmed	Online / within Supporting Document
Description of the stream morphology at the proposed location, and up to 1 km upstream and downstream (e.g. width and depth of stream, stream bed substrate types, bank stability, presence of pools, rifle runs, sand bars, etc.).	☒ Confirmed	Online / within Supporting Document
Description of the riparian habitats at and adjacent to the proposed location (e.g. Intact native vegetation, presence of weeds and other disturbances).	☒ Confirmed	Online / within Supporting Document
Description of the stream hydrology (e.g. flood frequency and height, altered flow regimes due to existing waterway barriers) • *Note: for most applications involving permanent waterway barriers on larger waterways, specific data on stream hydrology and flood levels will be required.*	☒ Confirmed	Online / within Supporting Document
Description of likely changes to stream hydrology resulting from construction of the proposed barrier. • *Note: for most applications involving permanent waterway barriers on larger waterways, the results of hydrological modelling will be required to show expected changes to flow characteristics, particularly velocity, at different water levels, expected headwater/tail water differences at different water levels, and frequency, timing and duration of drown-out of the proposed structure.*	☒ Confirmed	Online / within Supporting Document
Aquatic ecology details for all applications		
Description of the aquatic ecology at, and adjacent to, the proposed location, including instream fauna and flora, fish assemblages, and endangered or vulnerable fish species.	☒ Confirmed	Online / within Supporting Document

Description of likely impacts on fish movements as a result of construction of the waterway barrier, with reference to expected changes instream hydrology.	☒ Confirmed	Online / within Supporting Document
Description of likely impacts on both riparian and aquatic habitats as a result of construction of the waterway barrier, including impacts due to the expected changes instream hydrology.	☒ Confirmed	Online / within Supporting Document
Description of any proposed disturbances to riparian and aquatic habitats associated with construction activities (e.g. site access for machinery and personnel, material laydown areas, potential turbidity or other water quality impacts).	☒ Confirmed	Online / within Supporting Document
Details of the construction for all applications		
Scaled drawings of the proposed waterway barrier works.	☒ Confirmed	Online / within Supporting Document
If a fishway is proposed, scaled drawings of the fishway and details of proposed operation and maintenance of the fishway.	☐ Confirmed ☒ Not applicable	
Time frame for construction of the proposed barrier.	☒ Confirmed	Online / within Supporting Document
Mitigation details for all applications		
Description of any design features of the proposed waterway barrier that will help to mitigate the impacts of the structure on fish movements.	☐ Confirmed ☒ Not applicable	
Description of all measures that will be implemented during the construction period to mitigate the impacts of construction on aquatic habitats.	☒ Confirmed	Online / within Supporting Document
Description of all measures that will be undertaken at the completion of construction activities to restore the site to its previous condition or better.	☒ Confirmed	Online / within Supporting Document

For applications relating to section 5 of this form (separate information to be provided for each barrier)		
Culvert design information including: • whether the invert of the culvert is above, at or below waterway bed levels • size, angle, numbers and position of any baffles along the inner walls of the culverts • details of the culvert cell bed (bed material, rocks to aid fish passage, riffle, smooth concrete or roughness, baffles, etc) • whether there will be a low flow channel culvert in any multi-cell culverts • detail on whether the culvert base gradient is less than, the same as or more than the natural gradient of the waterway bed.	☐ Confirmed	
For applications relating to section 6 of this form (separate information to be provided for each barrier)		
All dimensions of the barrier	☒ Confirmed	Online / within Supporting Document
Detailed drawings of the barrier design	☒ Confirmed	Online / within Supporting Document

The operational requirements of the barrier	☒ Confirmed	Online / within Supporting Document
Details of any aprons, embankments or other erosion control methods	☒ Confirmed	Online / within Supporting Document
The specific structural inclusions to improve fish passage across the barrier	☒ Confirmed	Online / within Supporting Document

Privacy—please refer to your assessment manager, referral agency and/or building certifier for further details on the use of information recorded in this form.

OFFICE USE ONLY

Date received		Reference numbers	

The *Sustainable Planning Act 2009* is administered by the Department of Infrastructure, Local Government and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agency.

Queensland Government

DEPARTMENT OF NATURAL RESOURCES AND MINES

Application form
Contact and Land Details
Part A

Application form requirements

1. **Part A:** Contact and land details will need to be completed.
2. **Part B:** Application specific form will need to be completed.
3. Payment of the prescribed application fee, if relevant. A refund of application fees will not be given. (Details of fees are available on the Department of Natural Resources and Mines (DNRM) website or from a regional DNRM office)
4. All parts of this application form need to be completed accurately, otherwise your application may be returned to you to complete.

Important information

All applications will be processed having regard to the requirements of the *Land Act 1994* and related legislation, approved policies and procedures and the requirements of all other agencies with an interest in the land.

All completed applications can be lodged with DNRM by sending information to the following email or postal addresses or in person at your local DNRM business centre.

Email:
SLAMlodgement@dnrm.qld.gov.au

If lodging an application via email the application form must be signed and details of payment method included in the email along with all relevant supporting documentation.

Post:
Department of Natural Resources and Mines
PO Box 5318
TOWNSVILLE QLD 4810

In terms of the *Right to Information Act 2009* interested parties may seek access to DNRM records and view relevant documents.

Information on this form, and any attachments, is being collected to process and assess your application under the *Land Act 1994*. The consideration of your application may involve consultation and if so details of your application may be disclosed to third parties. They will not be otherwise disclosed outside the department unless required or authorised by law.

Contact details

Lodger Details and Mailing Address

A lodger is only required when a solicitor, bank, consultant etc lodges the application on behalf of the applicant.

Full Name(s)

Title	First name	Surname
Mrs	Kylie	Cauchi

Company name(s)

GHD Pty Ltd

Postal Address	PO Box 819 Cairns, QLD, 4870		
Phone number	(07) 4044 2209	**Mobile phone**	0434436089
Email			
Fax			

Applicant(s) Details and Mailing Address

If the applicant is a Corporation, either the Australian Company number, Australian Registered Body number or the Australian Business number must be shown.

Full Name(s)

Title	First name	Surname

Company name(s)

Douglas Shire Council

If a Corporation then record ☐ ACN ☐ ARBN ☑ ABN 71 241 237 800

Postal Address

PO Box 723
Mossman, QLD, 4873

Phone number (07) 4099 9444 or 1800 026 318 **Mobile phone**

Email

Fax (07) 4089 2902

Future correspondence should be sent to ☑ Lodger ☐ Applicant

Details of land for which the application is being lodged

1. Select the type of land for which the application is being lodged.

- ☐ Permit
- ☐ Lease
- ☐ Licence
- ☑ Unallocated State Land (USL) **go to 2**
- ☐ Trust Land Reserve/Deed of Grant in Trust (DOGIT)
- ☐ Road
- ☐ Other

2. Enter the description of the land for which the application is being lodged. If this application concerns a road, enter the description of the land adjoining the road.

Schedule 1
You must enter either the Lot on Plan or Title Reference of the land for which the application is being lodged

Lot	Plan	Title Reference
26	RP804231	
24	RP800895	
Esplanade in Mossman River		
Esplanade in Mossman Sth Rive		

go to 3

The details of the land can be found on a current copy of the Title or on your rates notice.
If insufficient space, please add additional description as an attachment.

3. Enter additional details of the land

Dealing number

Tenure type: Unallocated — Tenure number

Local Government: Douglas Shire Council

Other details of land location (optional): Owner consent is sought for restoration of a section of Esplanade in Mossman and Mossman South River adjacent to Mossman Water Treatment Plant. The road is Junction Road Reserve and adjoins freehold land of Lot 26 on RP804231 and Lot 24 on RP800895.

go to 4

4. Have you participated in a pre-lodgement meeting with the department? ☑ Yes **go to 5** ☐ No

5. Provide details of pre-lodgement meeting. (optional)
(If there is insufficient space, please lodge as an attachment)

Request for pre-lodgement submitted to SARA. Reference SPL-1216-035975.
Pre-lodgement advice received 1st February 2017.
MyDAS Application Reference SDA-0117-036630.

Departmental Officers contact details and any reference number should be included if known.

THIS FORM MUST BE ACCOMPANIED BY THE RELEVANT PART B APPLICATION FORM.

Queensland Government

DEPARTMENT OF NATURAL RESOURCES AND MINES

Application for owners consent to development applications

Part B

Application form requirements

1. This application is for owners consent to a development application.
2. Read the *Application for owners consent to a development application* fact sheet that includes application restrictions.
3. Payment of the prescribed application fee, if relevant.
   (Details of fees are available on the Department of Natural Resources and Mines (DNRM) website or from a regional DNRM office)
4. Any additional information to support the application.
5. **Part A:** Contact and details of land will need to be completed and submitted with your application.
6. If all parts of the application form are not filled out correctly, it may be returned to you to complete.

Important information

Section 263 of the *Sustainable Planning Act 2009* (SPA) requires the Department of Natural Resources and Mines (DNRM) to provide owners consent to a development application relating to some state land.

Where owners consent is required for specific state land, the application is to be made only by, or on behalf of, the person who:

- holds or will hold the appropriate tenure or interest e.g. lessee, sublessee, trustee of trust land, trustee lessee, grantee of an easement; or
- if no tenure is required by DNRM, the person who will occupy the land.

Consideration to providing owners consent to a development application will only be given by DNRM where the:

- applicant holds a tenure or interest in state land that supports the proposed development
- applicant has accepted an offer for a tenure or interest in state land that supports the proposed development
- proposed development does not require tenure or interest in state land e.g. a tidal work for public purposes such as a power line, public boat ramp.

It is a mandatory requirement of the SPA that development applications be lodged on IDAS form 1: Application details, with all necessary other forms or attachments included.

Development under the SPA includes reconfiguration of a lot. Reconfiguration of a lot held under a *Land Act 1994* tenure is not assessed under the provisions of the SPA e.g. subdivision of a lease, including a freeholding lease, issue of a trustee lease of a reserve - you will need to make the relevant application to deal with the land under the Land Act. However, an exception is for a deed of grant in trust in some circumstances e.g. for a trustee lease with a term of more than 10 years, a development application under SPA may also be required.

Information on this form, and any attachments, is being collected to process and assess your application under the *Land Act 1994*. The consideration of your application may involve consultation and if so details of your application may be disclosed to third parties. They will not be otherwise disclosed outside the department unless required or authorised by law.

1.	Is the development application for reconfiguration of a lot as outlined below held under *Land Act 1994* tenure?	☐ Yes An application can not be considered	☑ No	go to 2

Reconfiguration of land administered under the *Land Act 1994* e.g. subdivision of a lease, including a freeholding lease, issue of a trustee lease of a reserve, is not assessed under the provisions of the SPA - you will need to make the relevant application to deal with the land under the Land Act. However, for a deed of grant in trust in some circumstances eg. for a trustee lease with a term of more than 10 years, a development application under SPA may also be required.

A copy of the IDAS Form 7 must accompany this application.

2.	Is your development for tidal works for a structure e.g. a jetty, pontoon or boat ramp for residential use adjoining private land outside of a canal and not within a declared fish habitat area?	☐ Yes Your application must be lodged with the Department of Environment and Heritage Protection	☑ No	go to 3

If the proposed development is for a structure such as a jetty, pontoon or boat ramp for residential use adjoining private land outside of a canal, the Environmental business unit of Department of Environment and Heritage Protection gives owners consent. No owners consent is required for development applications for tidal works within a canal, as defined under the *Coastal Protection and Management Act 1995*.

If your application is for tidal works partly or wholly within a declared fish habitat area under the *Fisheries Act 1994*, it is recommended that you contact the Department of Agriculture, Fisheries and Forestry in the first instance.

A copy of the IDAS Form 23 must accompany this application.

3.	Is this application for a material change of use on State land for quarry material administered under the Forestry Act 1959?	☐ Yes Your application must be lodged with the Department of Agriculture, Fisheries and Forestry	☑ No	go to 4

You will need to contact Forest Products in the Department of Agriculture, Fisheries and Forestry in the first instance.

A copy of the IDAS Form 5 must accompany this application.

4. Owners consent is required to be given by DNRM for land listed below. If you require owners consent for a development application for quarry materials or any state resources \ not listed below, you will need to contact the relevant Queensland Government department administering the resource.

Please select the following if applicable to your development application:

☐	a lease (including a freeholding lease) reserve or deed of grant in trust under the *Land Act 1994* where DNRM acts on behalf of the state as the lessee or trustee of the land	**go to 5**
☐	a lease under the *Land Act 1994* (including a freeholding lease) reserve or deed of grant in trust if the lessee or trustee is not or does not represent the state	**go to 5**
☐	strategic port land under the *Transport Infrastructure Act 1994*, other than freehold land	**go to 5**
☐	a permit to occupy or licence under the *Land Act 1994*	**go to 5**
☐	land held in fee simple by the state where DNRM administers the freehold on behalf of the state	**go to 5**
☑	unallocated state land under the *Land Act 1994* including land below high water mark —other than as outlined in question two of this application form	**go to 5**
☑	a road (other than a state-controlled road) or stock route	**go to 5**

5. Is the applicant the holder of a tenure or a secondary interest in the state land e.g. lessee or sublessee of a *Land Act 1994* lease, trustee of a reserve or deed of grant in trust, grantee of an easement?

☑ Yes **go to 9** ☐ No **go to 6**

6. Has an application for appropriate tenure been made?

☐ Yes **go to 7** ☐ No

An application can not be considered—refer below

Owners consent where tenure is required for the development may not be given unless DNRM has made an offer and you have accepted that offer. If you have already applied for an appropriate tenure, you will need to wait until you have received an offer from DNRM. If you have not already applied for tenure, you will need to do so.

In limited situations, tenure may not be required particularly for public tidal works, and you may wish to discuss your application with DNRM before applying for tenure.

7. Provide details of the application for appropriate tenure, including DNRM reference.
(If there is insufficient space, please lodge as an attachment)

go to 8

8. Has DNRM made an offer that has been accepted?

☐ Yes **go to 9** ☐ No

An application cannot be considered

If you have already applied but are awaiting an offer, or have been made an offer and have not yet accepted, consideration to providing owners consent will be made when the appropriate tenure requirements are in place.

9.	Have you made a previous application for owners consent?	☐ Yes	go to 10	☑ No	go to 12
10.	Was this application refused?	☐ Yes	go to 11	☐ No	go to 12
11.	Has there been any change in circumstances from the previous application, which may lead to this application being accepted for further consideration?	☐ Yes	go to 12	☐ No	go to 13

12. Provide details of any additional information to support the application. (optional)
(If there is insufficient space, please lodge as an attachment) go to 13

Additional information includes aerial site map and riverbank revetment drawings, se

Attachments

The following will need to be lodged with your application for it to be considered. If this information is not submitted, your application will be returned.

13. Tick the box to confirm the attachments for part of the application.

☐ Application fee

☑ Copy of the Development Application and all other necessary Forms being –

- original IDAS Form 1
- if you are making an application to reconfiguring a lot – IDAS from 7
- if you are making an application for Material Change of Use – IDAS Form 5
- if you are making an application for Tidal Works – IDAS Form 23;
- sketches/plans of existing and proposed improvements proposed to be lodged with the assessment manager.

Note – the department does not generally require the full development application, such as engineer drawings, but will require as much of the development application clearly showing the proposed development .

☐ Details of application for tenure or road closure (if relevant) e.g. department reference

☑ If the applicant is acting on behalf of a person that holds or will hold the tenure, or if no tenure is required, the person who will be occupying the state land, a letter from that person advising you are acting for and on behalf of them is required.

☐ If the development application relates to a secondary interest in the state land e.g. sublease, trustee lease etc., a letter from the lessee, trustee etc. as relevant that they support the application will also be required.

It is recommended that any attached plans, sketches or maps be of A4 or A3 size. Your application will not be considered, unless all parts of this application form are completed accurately. In this instance your application may be returned to you for completion.

Declaration

I certify that I have read the information which forms part of this application and the information I have provided is true and accurate.

Signature of applicant (or their legal representative)

SCOTT HAHNE - PROJECT ENGINEER, DOUGLAS SHIRE COUNCIL

S Hahne

Date: 24 / 5 / 2017

If applicant, section 142 of the *Land Act 1994* states a person is eligible to apply for, buy or hold land under the *Land Act 1994* if the person is an adult, that is, 18 years of age or over.
If the legal representative of the applicant is signing as the applicant then the legal representative's full name must be printed immediately below the signature.

Amanda Smedley

From: Kylie Cauchi
Sent: Wednesday, 14 June 2017 9:49 AM
To: GEISLER Graeme
Cc: Iain Brown; Amanda Smedley; Andrew Small
Subject: RE: Mossman Water Treatment Plant Lodgement for DA

CompleteRepository: 4219890
Description: delivery task check
JobNo: 19890
OperatingCentre: 42
RepoEmail: 4219890@ghd.com
RepoType: Job

Hi Graeme

Thanks very much.
Regards

Kylie Cauchi
Senior Environmental Scientist

GHD
T: 61 07 4044 2209 | V: 422 209 | M: 61 434 436 089 | E: Kylie.Cauchi@ghd.com
1st Floor 85 Spence Street PO Box 819 CAIRNS QLD 4870 Australia | www.ghd.com
WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

From: GEISLER Graeme [mailto:Graeme.Geisler@dnrm.qld.gov.au]
Sent: Wednesday, 14 June 2017 9:46 AM
To: Kylie Cauchi <Kylie.Cauchi@ghd.com>
Subject: RE: Mossman Water Treatment Plant Lodgement for DA

Good Morning Kylie

I wish to advise that I have been allocated the following case for Owner's Consent:

Case Number	Description of Land
2017/002411	The Esplanades and USL of Mossman and South Mossman Rivers, the Road Reserve of Junction Road, Mossman. Adjoining Freehold Lots are Lot 26 on RP804231 and Lot 24 on RP800895

I will contact you further as matters progress, however, if you require any information about the processing of this application, please let me know.

I have today requested the views of the Department of Environment and Heritage Protection. Under the Memorandum of Understanding between our department's they have until 12 July to provide those views.

Regards

Graeme Geisler
Administration Officer
State Land Asset Management | North Region
Department of Natural Resources and Mines

T 07 4741 1657 **E** graeme.geisler@dnrm.qld.gov.au
65 Brodie St | Hughenden Qld 4821
PO Box 5318 Townsville Qld 4810

From: Kylie Cauchi [mailto:Kylie.Cauchi@ghd.com]
Sent: Monday, 12 June 2017 10:10 AM
To: enquiries@douglas.qld.gov.au; SLAM Lodgement <SLAMlodgement@dnrm.qld.gov.au>
Cc: Andrew Small <Andrew.Small@ghd.com>; scott.hahne@douglas.qld.gov.au; Iain Brown <Iain.Brown@ghd.com>
Subject: Mossman Water Treatment Plant Lodgement for DA

Dear Sir/Madam

Please find attached required documentation as per DILGP prelodgement advices SPL-1216-035975 for Mossman Water Treatment Plant Riverbank Stabilisation Works on behalf of Douglas Shire Council as Assessment Manager.

SLAM Case Reference 2017/002411 is also quoted for Owners Consent application processing.

This project is coordinated by Scott Hahne, Project Engineer, Douglas Shire Council.

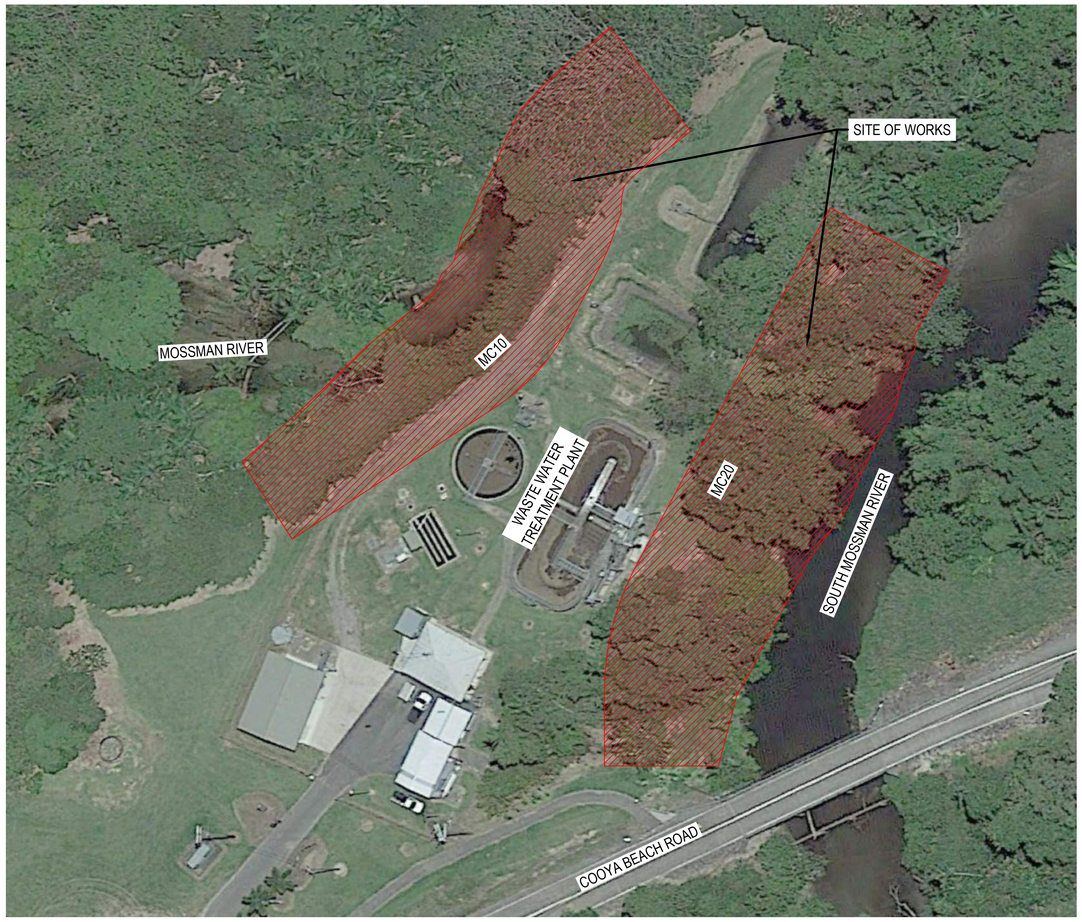
Regards

Kylie Cauchi
Senior Environmental Scientist

GHD
T: 61 07 4044 2209 | V: 422 209 | M: 61 434 436 089 | E: Kylie.Cauchi@ghd.com
1st Floor 85 Spence Street PO Box 819 CAIRNS QLD 4870 Australia | www.ghd.com
WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

Appendix B – Design Drawings

DOUGLAS SHIRE COUNCIL
MOSSMAN WASTE WATER TREATMENT PLANT
BANK STABILISATION
42-19890



LOCALITY PLAN
NOT TO SCALE

DRAWING LIST	
DRAWING NUMBER	DRAWING TITLE
42-19890-G001	COVER SHEET, DRAWING LIST AND LOCALITY PLAN
42-19890-G002	CONSTRUCTION NOTES
42-19890-C001	GENERAL ARRANGEMENT PLAN
42-19890-C002	TYPICAL SECTION
42-19890-C003	ANNOTATED SECTIONS - CONTROL LINE MC10 - SHEET 1
42-19890-C004	ANNOTATED SECTIONS - CONTROL LINE MC10 - SHEET 2
42-19890-C005	ANNOTATED SECTIONS - CONTROL LINE MC10 - SHEET 3
42-19890-C006	ANNOTATED SECTIONS - CONTROL LINE MC10 - SHEET 4
42-19890-C007	ANNOTATED SECTIONS - CONTROL LINE MC20 - SHEET 1
42-19890-C008	ANNOTATED SECTIONS - CONTROL LINE MC20 - SHEET 2
42-19890-C009	ANNOTATED SECTIONS - CONTROL LINE MC20 - SHEET 3
42-19890-C010	ANNOTATED SECTIONS - CONTROL LINE MC20 - SHEET 4
42-19890-C011	ANNOTATED SECTIONS - CONTROL LINE MC20 - SHEET 5

SERVICE LOCATIONS

It is the responsibility of the Foreman to contact the relevant service authorities to ascertain the exact location of services prior to construction.

DIAL BEFORE YOU DIG

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

DO NOT SCALE

Drawn J. BARCIAL | Designer D. TRUSS
Drafting Check G. DOUGHERTY* | Design Check G. NEWNHAM*
Approved (Project Director) J. TURNER*
Date 23.05.17
Scale NTS
This Drawing must not be used for Construction unless signed as Approved

Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title COVER SHEET, DRAWING LIST AND LOCALITY PLAN

Original Size A1
Drawing No: 42-19890-G001
Rev: 0

Plot Date: 23 May 2017 - 10:23 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-G001.dwg

SERVICES NOTES:

THE LOCATION OF UNDERGROUND SERVICES HAVE BEEN APPROXIMATED FROM THE SURVEY PROVIDED AND DIAL BEFORE YOU DIG INFORMATION. DETAILS OF UTILITY SERVICES ARE PROVIDED FOR INFORMATION ONLY AND NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY AND COMPLETENESS OF THE INFORMATION SUPPLIED. POSITIONS OF ALL SERVICES AND CONFLICT POINTS SHALL BE RECORDED AND CHECKED BY THE CONTRACTOR. WORK SHALL NOT BE CARRIED OUT WITHIN 2.0m OF ANY SERVICE WITHOUT NOTIFYING AND LIAISING WITH THE RELEVANT AUTHORITY PRIOR. BURIED WWTP SERVICES WHICH FALL WITHIN THE CONSTRUCTION FOOTPRINT SHALL BE RELOCATED AS DIRECTED BY DSC.

GENERAL NOTE:

ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH TRANSPORT AND MAIN ROADS TECHNICAL SPECIFICATION MRTS04

SERVICE RELOCATION:

1. RELOCATE WATER MAIN AS PER FNQRoC DESIGN GUIDELINES. NEW LOCATION FOR WATER MAIN TO BE CONFIRMED WITH DOUGLAS SHIRE COUNCIL PRIOR TO RELOCATION.

EXCAVATION AND FOUNDATION PREPARATION

1. EXCAVATION SHALL BE CARRIED OUT IN VERTICAL BENCHES OF NOT MORE THAN 1.0m IN HEIGHT. THE HORIZONTAL EXTENT OF BENCHES SHALL BE DETERMINED BASED ON MATERIAL STRENGTH REQUIREMENTS, AS DESCRIBED IN NOTE 2. THE AVERAGE GRADIENT OF THE BENCHED SLOPE (PRIOR TO PLACEMENT OF ROCKFILL) SHALL BE NOT MORE THAN 45 DEGREES.
2. EXCAVATE ALL LOOSE OR SOFT TO FIRM MATERIAL AND FAILED/SLIPPED MATERIAL. IF THE MATERIAL AT THE FOUNDATION LEVEL IS LOOSE, EXCAVATE FURTHER TO UP TO 0.5m THICKNESS TO CREATE A STABLE FOUNDATION. THE INSITU MATERIAL AT THE FOUNDATION AND BEHIND THE ROCKFILL ZONE SHALL BE INTACT, NON-SLIPPED MATERIAL OF STIFF (OR BETTER) CONSISTENCY, WITH UNDRAINED SHEAR STRENGTH OF 50 kPa OR HIGHER. FURTHER, MATERIALS WITH ADVERSELY ORIENTED FISSURES OR SLICKENSIDED DISCONTINUITIES SHALL BE OVER-EXCAVATED AND REPLACE WITH ROCKFILL. GEOTECHNICAL ENGINEER SHALL INSPECT AND ACCEPT THE FOUNDATION MATERIAL PRIOR TO CONSTRUCTION AS A HOLD POINT. MINOR OVER-EXCAVATION TO EXTENTS SHOWN MAY BE REQUIRED, AS DEPENDENT ON SITE INSPECTION OUTCOMES.
3. AFTER APPROVAL BY GEOTECHNICAL ENGINEER, CONSTRUCTION SHOULD BE UNDERTAKEN AS SOON AS POSSIBLE TO PREVENT FOUNDATION DRYING OUT OR WETTING DUE TO EXPOSURE.
4. WHERE APPROPRIATE, THE AREA ABOVE THE TEMPORARY BENCHES SHALL REMAIN CORDONED OFF TO REDUCE THE RISK TO PASSERS BY AND TO REDUCE SURFACE LOADING AT THE CREST.
5. AN ASSESSMENT IS TO BE MADE BY THE CONTRACTOR REGARDING CONSTRUCTION PLANT AND WWTP MAINTENANCE VEHICLES LOADING ADJACENT TO VERTICAL BATTERS, AND TEMPORARY WORKS PROVIDED TO ENSURE STABILITY.

CONSTRUCTION-ROCKFILL

1. THE ROCKFILL SHALL BE GRADED AS SHOWN IN THE INDIVIDUAL DRAWINGS.
2. A GEOSYNTHETIC SEPARATOR, MRTS27 FILTRATION CLASS 'III' , STRENGTH CLASS 'E, SHALL BE INSTALLED AT THE ROCKFILL/SOIL INTERFACE.

MATERIAL PROPERTIES

1. ROCKFILL DESIGN ASSUMES THE FOLLOWING:

   FOUNDATION

   - SOIL DENSITY = 20 KN/M^3
   - UNDRAINED SHEAR STRENGTH ≥ 50 KPA
   - RECENTLY SLIPPED MATERIAL REMOVED AND REPLACED
   - ADVERSELY ORIENTED FISSURES / SLICKENSIDED DISCONTINUITIES REMOVED AND REPLACED

   ROCKFILL

   DENSITY = 20 KN/M^3

   - EFFECTIVE INTERNAL ANGLE OF FRICTION = 40°
   - EFFECTIVE COHESION = 0 KPA
2. ROCKFILL SHALL MEET THE SPECIFICATION OF DEPARTMENT OF TRANSPORT AND MAIN ROADS TECHNICAL SPECIFICATION MRTS04 AND OTHER REQUIREMENTS AS SET OUT IN THE WORKS SPECIFICATION.

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

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Drafting Check	G. DOUGHERTY*	Design Check	G. NEWNHAM*
Approved (Project Director)	J. TURNER*		
Date	23.05.17		
Scale	NTS	This Drawing must not be used for Construction unless signed as Approved	

Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title CONSTRUCTION NOTES

Original Size A1 Drawing No: 42-19890-G002 Rev: 0

Plot Date: 23 May 2017 - 10:24 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-G002.dwg

N

PROVIDE ROCKFILL OUTSIDE DESIGN CHAINAGES TO TIE NEATLY TO EXISTING SURFACE

PROVIDE ROCKFILL OUTSIDE DESIGN CHAINAGES TO TIE NEATLY TO EXISTING SURFACE

RELOCATE WATER MAIN AS PER FNQRoC DESIGN GUIDELINES.

REFER SERVICES NOTES ON 42-19890-G002 FOR RELOCATION DETAILS.

PROVIDE ROCKFILL OUTSIDE DESIGN CHAINAGES TO TIE NEATLY TO EXISTING SURFACE

PROVIDE ROCKFILL OUTSIDE DESIGN CHAINAGES TO TIE NEATLY TO EXISTING SURFACE

FLOW

ROCKFILL

MOSSMAN RIVER

TOE

BERM

TOP OF BANK

LAGOON

CLARIFIER

OXIDATION DITCH

CHLORINE PLANT

CONTROL LINE MC10

5m OFFSET FROM CONTROL LINE

5m OFFSET FROM CONTROL LINE

CONTROL LINE MC20

TOP OF BANK

BERM

FLOW

SOUTH MOSSMAN RIVER

TOE

ROCKFILL

TEMPORARY STOCKPILE SITE

ADMIN

SHED

JUNCTION ROAD

PROVIDE ROCKFILL OUTSIDE DESIGN CHAINAGES TO TIE NEATLY TO EXISTING SURFACE

GENERAL ARRANGEMENT PLAN

SCALE 1:250

SETOUT TABLE-CONTROL LINE MC10

PT	CHAINAGE	EASTING	NORTHING	LEVEL	BEARING	RAD/SPIRAL	A.LENGTH	D.ANGLE
IP1	0	326808.844	8180541.547	6.2	57°00'00.00"			
TC	29.703	326833.755	8180557.724	8.063	57°00'00.00"			
IP2	37.37	326840.329	8180561.993	8.358		-30	15.333	29°17'02.78"
CT	45.036	326843.974	8180568.932	8.51	27°42'57.22"			
TC	56.61	326849.357	8180579.178	8.493	27°42'57.22"			
IP3	59.154	326850.542	8180581.435	8.489		-30	5.087	9°42'57.22"
CT	61.697	326851.33	8180583.86	8.468	18°00'00.00"			
TC	63.02	326851.739	8180585.118	8.433	18°00'00.00"			
IP4	69.01	326853.648	8180590.992	8.222		20	11.98	34°19'09.83"
IP5	75	326858.535	8180594.767	8.32	52°19'09.83"			

SETOUT TABLE-CONTROL LINE MC20

PT	CHAINAGE	EASTING	NORTHING	LEVEL	BEARING	RAD/SPIRAL	A.LENGTH	D.ANGLE
IP1	0	326889.19	8180576.137	8.138	208°27'50.63"			
TC	56.151	326862.428	8180526.774	7.803	208°27'50.63"			
IP2	66.087	326857.592	8180517.855	7.436		-40	19.872	28°27'50.63"
CT	76.023	326857.592	8180507.709	6.197	180°00'00.00"			
IP3	78	326857.592	8180505.732	5.9	180°00'00.00"			

LEGEND:

- ANTICIPATED MAXIMUM EXTENT OF SITE DISTURBANCE
- WATER MAIN - NEW LOCATION
- SEWER PIPE A/G - EXISTING
- SEWER PIPE U/G - EXISTING
- WATER PIPE U/G - EXISTING
- ELECTRICAL U/G - EXISTING
- COMMUNICATIONS U/G - EXISTING
- TOP OF BANK
- TOE OF BANK
- BUILDING
- FENCE
- STOP VALVE
- HYDRANT
- BORE HOLE
- SEWER MANHOLE
- LIGHT POLE
- TREE
- 5m OFFSET FROM CONTROL LINE
- ROCKFILL

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

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Drafting Check G. DOUGHERTY* | Design Check G. NEWNHAM*
Approved (Project Director) J. TURNER*
Date 23.05.17
Scale 1:250

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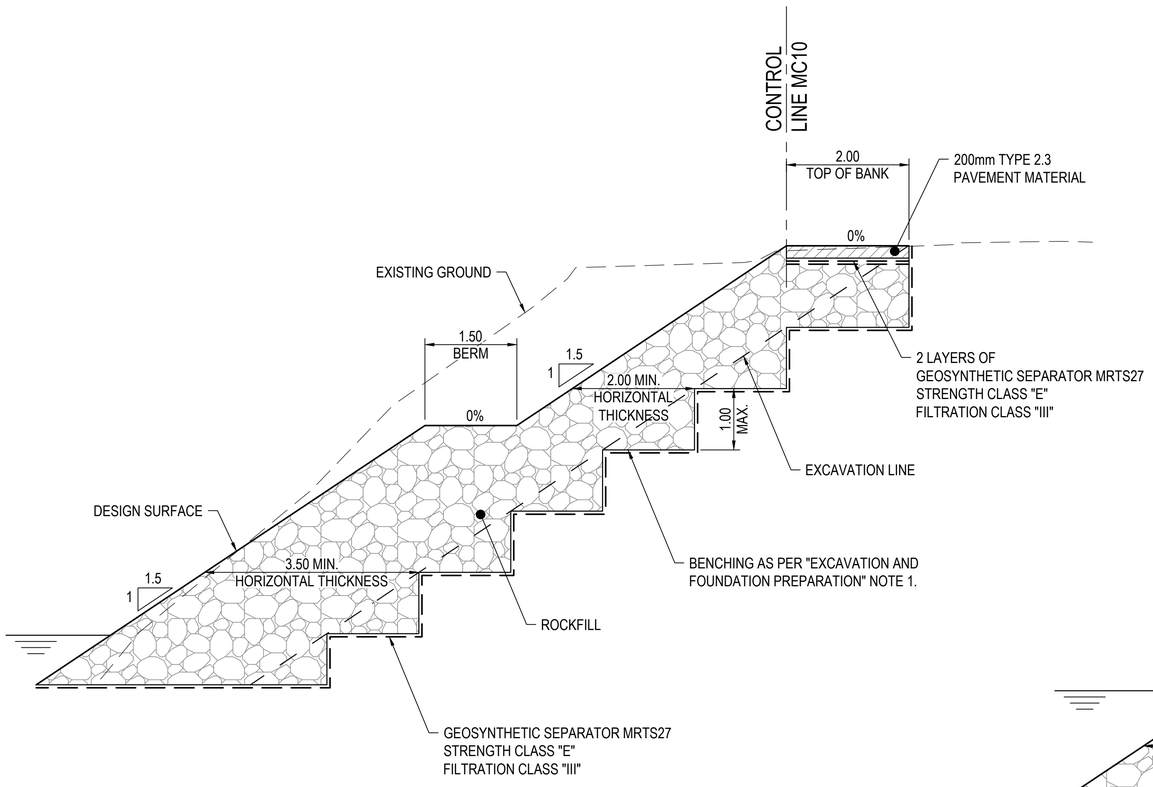
Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title GENERAL ARRANGEMENT PLAN

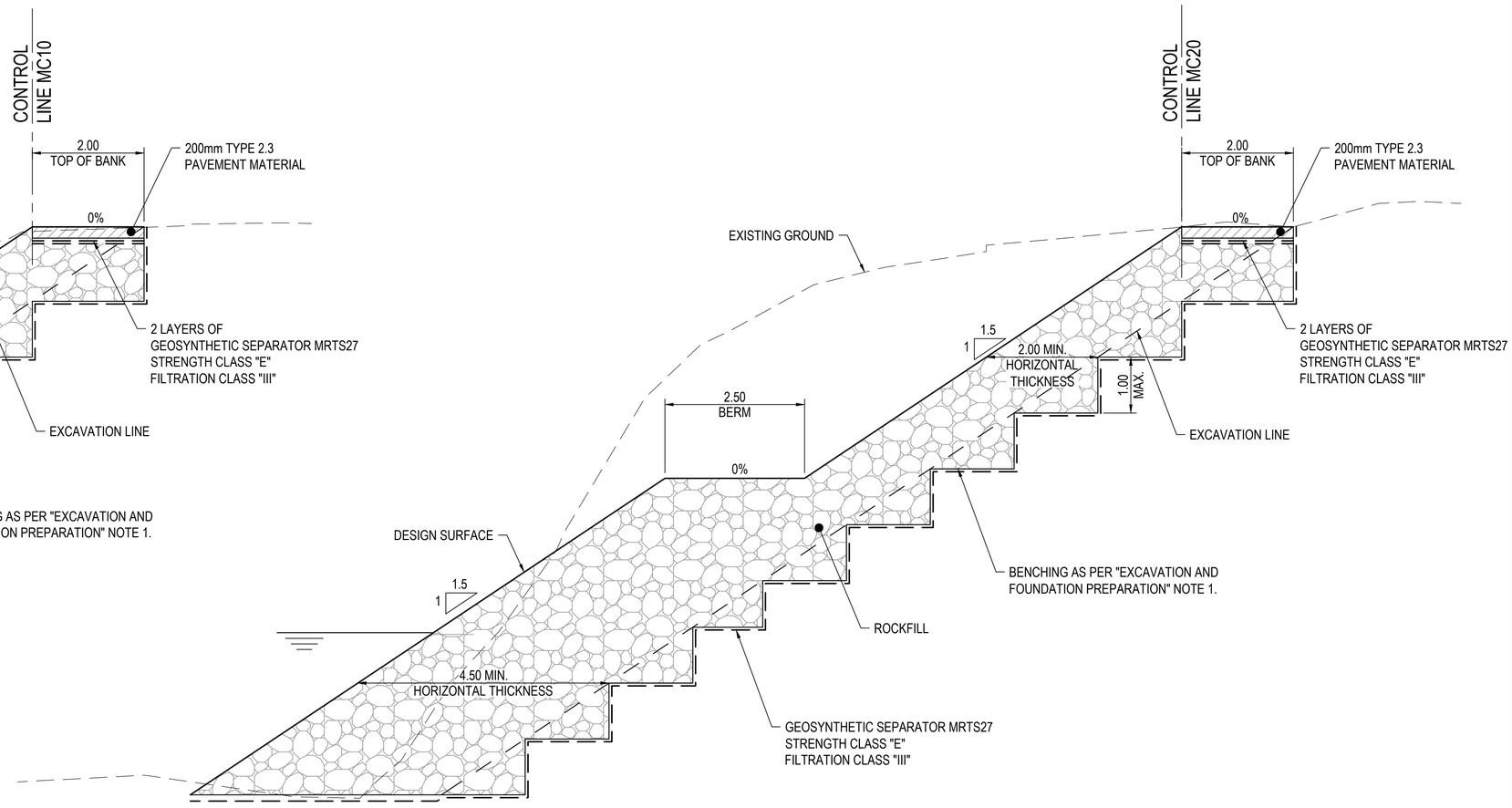
Original Size A1
Drawing No: 42-19890-C001
Rev: 0

Plot Date: 23 May 2017 - 10:25 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C001.dwg



TYPICAL SECTION (CONTROL LINE MC10)

SCALE 1:50



TYPICAL SECTION (CONTROL LINE MC20)

SCALE 1:50

0	FINAL ISSUE	NC	IB*	JT*	23.05.17
No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date

0 0.5 1.0 1.5 2.0 2.5m

SCALE 1:50 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM

Registration
RPEQ

Registration Discipline
GEOTECHNICAL

Signature
G.NEWNHAM*

No. 7452
Date 12.06.15

GHD

145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

DO NOT SCALE

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Drafting Check	G. DOUGHERTY*	Design Check	G. NEWNHAM*
Approved (Project Director)	J. TURNER*		
Date	23.05.17		
Scale	1:50	This Drawing must not be used for Construction unless signed as Approved	

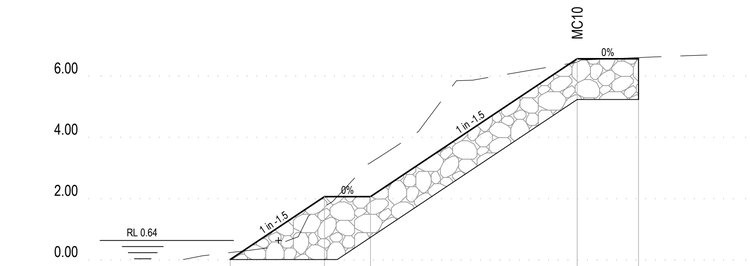
Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title TYPICAL SECTIONS

Original Size A1

Drawing No: 42-19890-C002

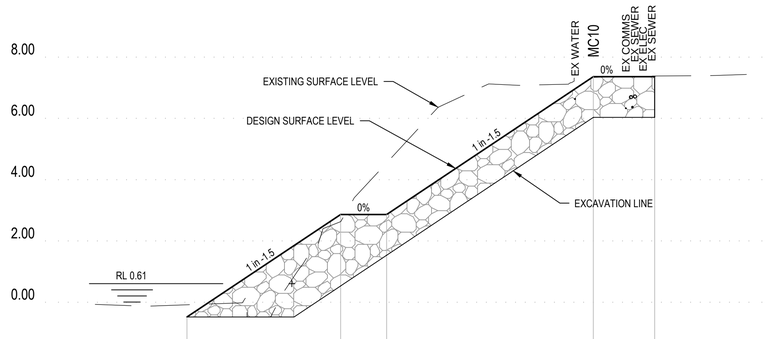
Rev: 0

Plot Date: 23 May 2017 - 10:28 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C002.dwg



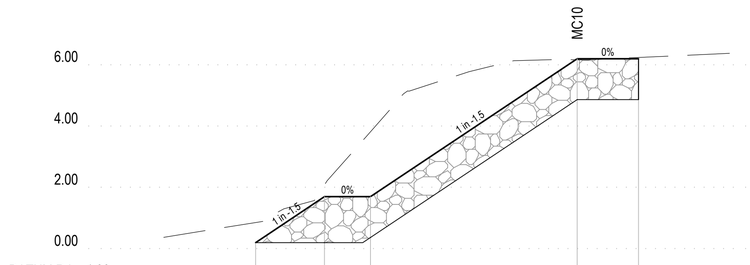
DATUM R.L. -1.00							
DESIGN SURFACE LEVEL	0.017	2.069	2.069			6.569	6.569
DEPTH CUT - / FILL +	-0.23	0.32	-1.11			0.11	-0.04
EXISTING SURFACE LEVEL	0.24	1.75	3.18			6.46	6.61
OFFSET FROM CENTRELINE	-11.33	-8.25	-6.75			0	2

CH 5



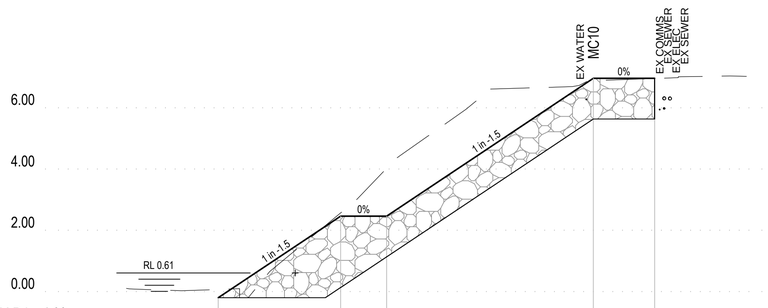
DATUM R.L. -2.00							
DESIGN SURFACE LEVEL	-0.475	2.869	2.869			7.369	7.369
DEPTH CUT - / FILL +	-0.4	0.23	-1.69			0.02	-0.02
EXISTING SURFACE LEVEL	-0.08	2.64	4.56			7.35	7.39
OFFSET FROM CENTRELINE	-13.27	-8.25	-6.75			0	2

CH 15



DATUM R.L. -1.00							
DESIGN SURFACE LEVEL	0.2	1.7	1.7			6.2	6.2
DEPTH CUT - / FILL +	-0.66	-0.39	-2.12			0.03	-0.04
EXISTING SURFACE LEVEL	0.86	2.09	3.82			6.17	6.24
OFFSET FROM CENTRELINE	-10.5	-8.25	-6.75			0	2

CH 0



DATUM R.L. -1.00							
DESIGN SURFACE LEVEL	-0.195	2.469	2.469			6.969	6.969
DEPTH CUT - / FILL +	-0.27	-0.11	-1.56			0.08	0.01
EXISTING SURFACE LEVEL	0.07	2.57	4.03			6.89	6.96
OFFSET FROM CENTRELINE	-12.25	-8.25	-6.75			0	2

CH 10

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
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Date 23.05.17
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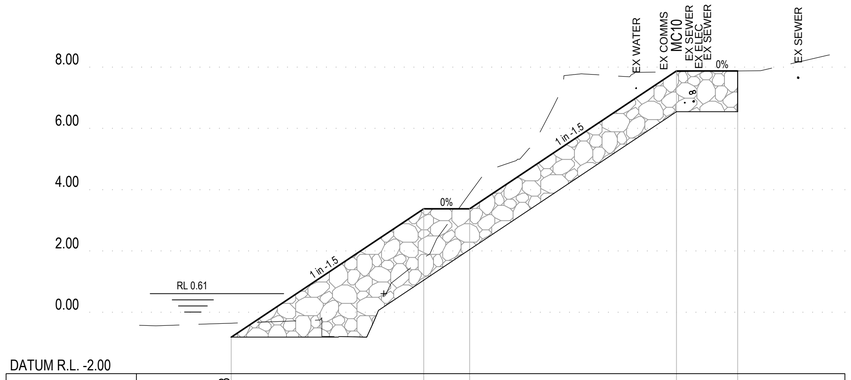
Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC10 SHEET 1

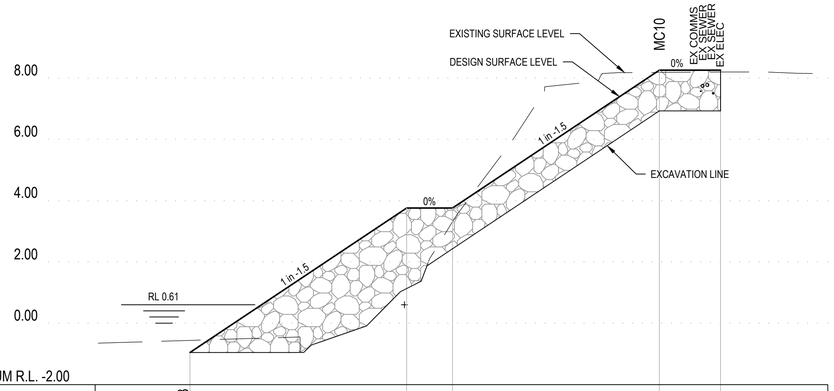
Original Size A1
Drawing No: 42-19890-C003
Rev: 0

Plot Date: 23 May 2017 - 10:29 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C003-C006.dwg



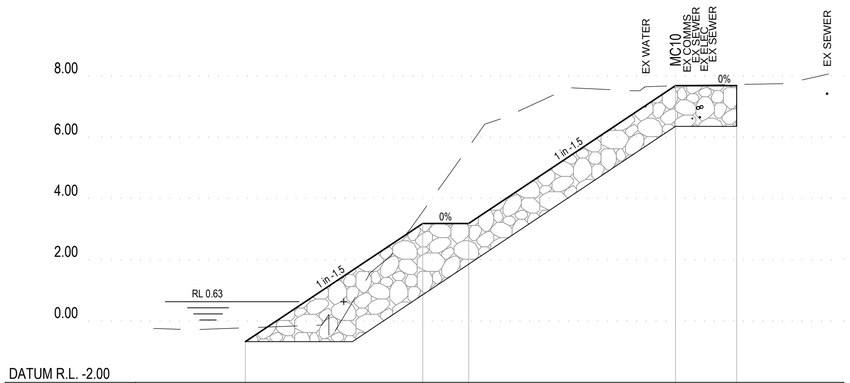
DATUM R.L. -2.00						
DESIGN SURFACE LEVEL	-0.808	3.382	3.382	7.882	7.882	
DEPTH CUT - / FILL +	-0.46	1.59	-0.5	0.02	-0	
EXISTING SURFACE LEVEL	-0.35	1.79	3.88	7.86	7.88	
OFFSET FROM CENTRELINE	-14.53	-8.25	-6.75	0	2	

CH 25



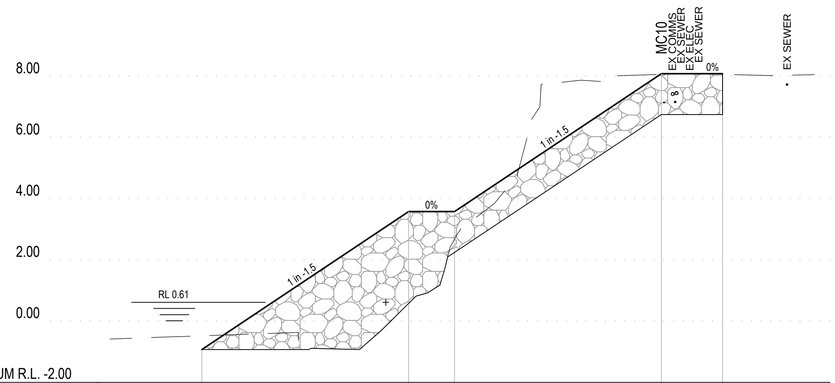
DATUM R.L. -2.00						
DESIGN SURFACE LEVEL	-0.948	3.767	3.767	8.267	8.267	
DEPTH CUT - / FILL +	-0.39	2.63	0.45	0.07	0.06	
EXISTING SURFACE LEVEL	-0.55	1.14	3.32	8.19	8.21	
OFFSET FROM CENTRELINE	-15.32	-8.25	-6.75	0	2	

CH 35



DATUM R.L. -2.00						
DESIGN SURFACE LEVEL	-0.671	3.188	3.188	7.688	7.688	
DEPTH CUT - / FILL +	-0.45	-0.39	-2.49	0.01	-0.03	
EXISTING SURFACE LEVEL	-0.22	3.58	5.68	7.68	7.72	
OFFSET FROM CENTRELINE	-14.04	-8.25	-6.75	0	2	

CH 20



DATUM R.L. -2.00						
DESIGN SURFACE LEVEL	-0.927	3.574	3.574	8.074	8.074	
DEPTH CUT - / FILL +	-0.45	3	0.9	0.02	0.02	
EXISTING SURFACE LEVEL	-0.48	0.58	2.68	8.05	8.06	
OFFSET FROM CENTRELINE	-15	-8.25	-6.75	0	2	

CH 30

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
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Signature G.NEWNHAM* No. 7452 Date 12.06.15

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Approved (Project Director) J. TURNER*
Date 23.05.17
Scale 1:100
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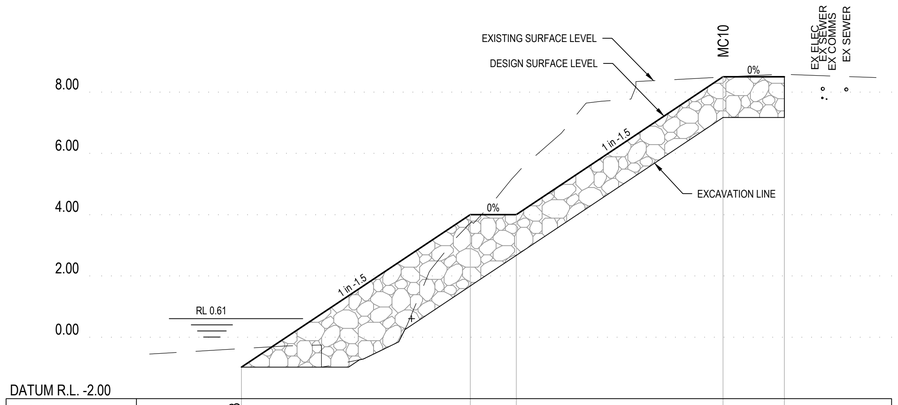
Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC10 SHEET 2

Original Size A1
Drawing No: 42-19890-C004
Rev: 0

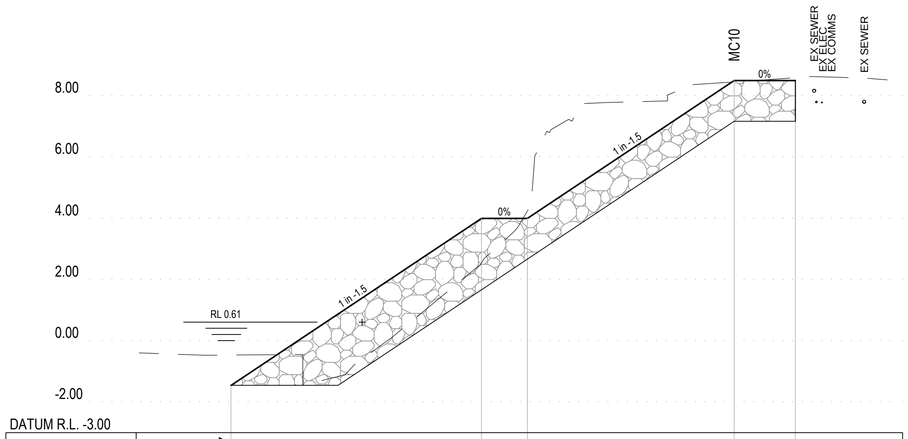
Plot Date: 23 May 2017 - 10:29 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C003-C006.dwg



DATUM R.L. -2.00

DESIGN SURFACE LEVEL	-0.973		4.01	4.01		8.51	8.51	
DEPTH CUT - / FILL +	-0.61	-0.36	0.28	-1.32		0.01	-0.08	
EXISTING SURFACE LEVEL	-0.36	-15.72	3.73	5.33		8.5	8.59	
OFFSET FROM CENTRELINE	-15.72		-8.25	-6.75		0	2	

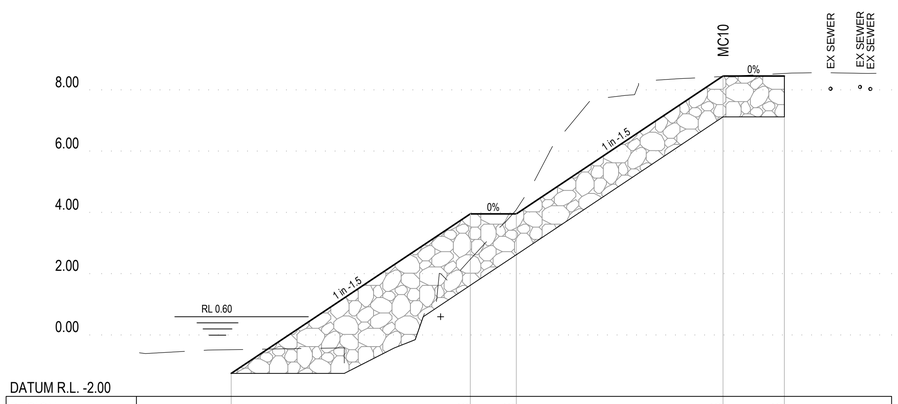
CH 45



DATUM R.L. -3.00

DESIGN SURFACE LEVEL	-1.457		3.995	3.995		8.495	8.495	
DEPTH CUT - / FILL +	-0.99	-0.47	1.46	-0.24		0.05	-0.09	
EXISTING SURFACE LEVEL	-0.47	-16.43	2.54	4.24		8.45	8.59	
OFFSET FROM CENTRELINE	-16.43		-8.25	-6.75		0	2	

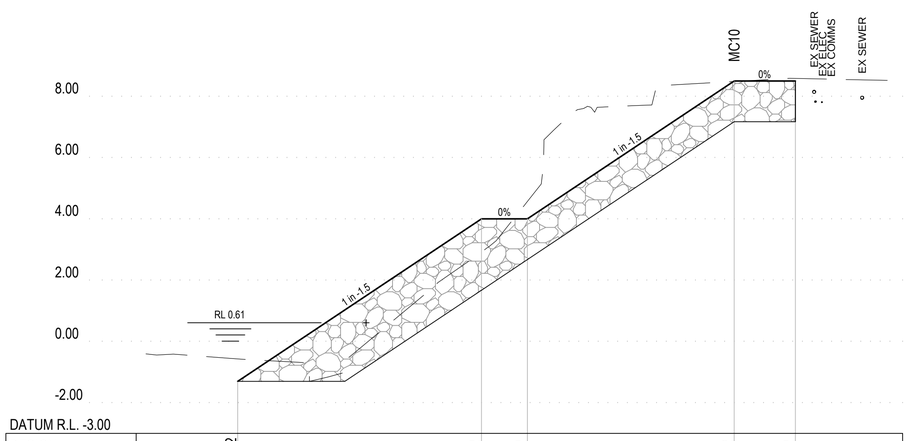
CH 55



DATUM R.L. -2.00

DESIGN SURFACE LEVEL	-1.25		3.955	3.955		8.455	8.455	
DEPTH CUT - / FILL +	-0.77	-0.48	1.48	-0.14		0.01	-0.09	
EXISTING SURFACE LEVEL	-0.48	-16.06	2.48	4.1		8.44	8.54	
OFFSET FROM CENTRELINE	-16.06		-8.25	-6.75		0	2	

CH 40



DATUM R.L. -3.00

DESIGN SURFACE LEVEL	-1.302		4.002	4.002		8.502	8.502	
DEPTH CUT - / FILL +	-0.73	-0.57	1.08	-0.57		0.02	-0.08	
EXISTING SURFACE LEVEL	-0.57	-16.21	2.92	4.57		8.49	8.59	
OFFSET FROM CENTRELINE	-16.21		-8.25	-6.75		0	2	

CH 50

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

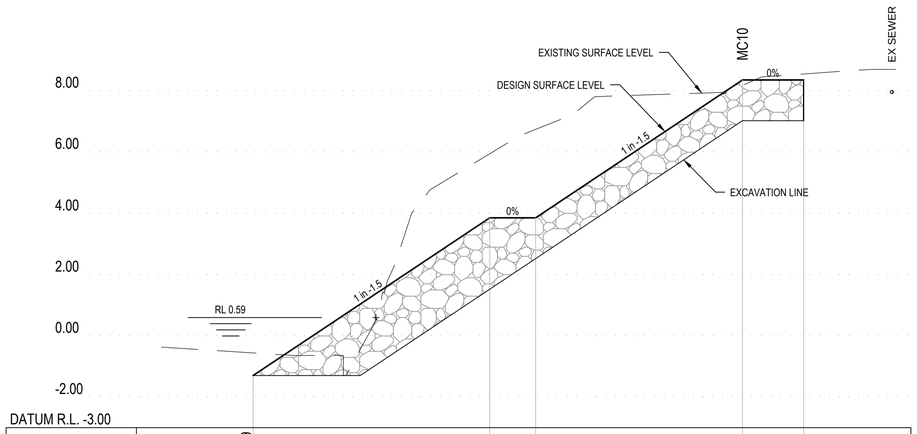
GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 F 61 7 3316 3333
E bnemail@ghd.com W www.ghd.com

Drawn J. BARCIAL | Designer D. TRUSS
Drafting Check G. DOUGHERTY* | Design Check G. NEWNHAM*
Approved (Project Director) J. TURNER*
Date 23.05.17
Scale 1:100
This Drawing must not be used for Construction unless signed as Approved

Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC10 SHEET 3

Original Size A1
Drawing No: 42-19890-C005
Rev: 0

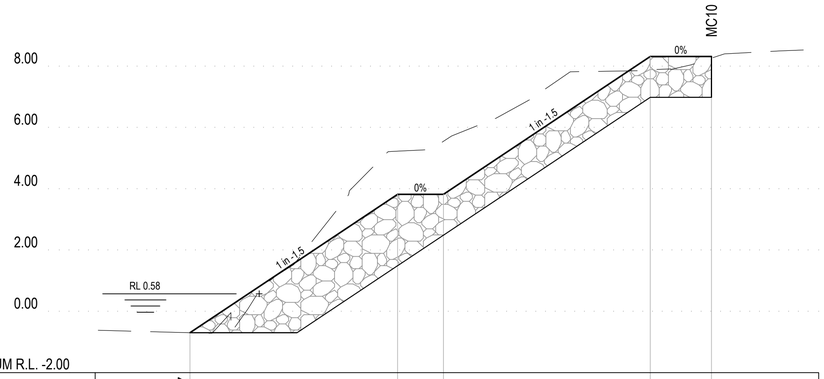
Plot Date: 23 May 2017 - 10:29 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C003-C006.dwg



DATUM R.L. -3.00

DESIGN SURFACE LEVEL	-1.299	3.85	3.85	8.35	8.35	
DEPTH CUT - / FILL +	-0.74	-2.09	-2.89	0.18	-0.2	
EXISTING SURFACE LEVEL	-0.56	5.94	6.74	8.17	8.55	
OFFSET FROM CENTRELINE	-15.97	-8.25	-6.75	0	2	

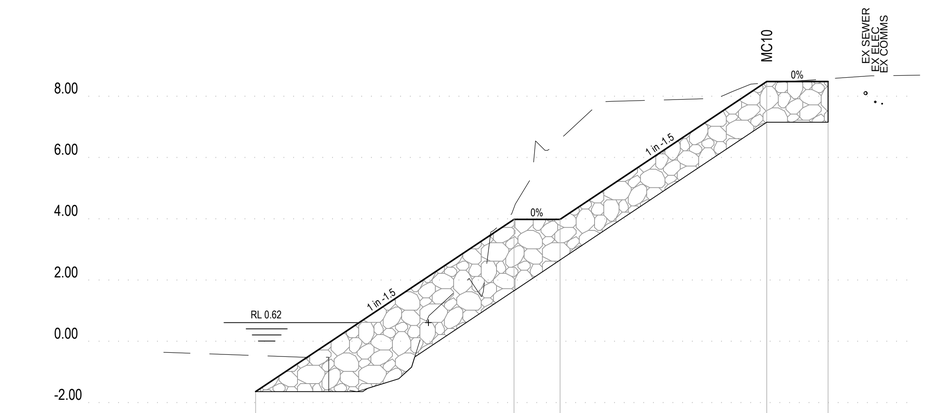
CH 65



DATUM R.L. -2.00

DESIGN SURFACE LEVEL	-0.697	3.82	3.82	8.32	8.32
DEPTH CUT - / FILL +	-0	-1.41	-1.73	0.44	0.05
EXISTING SURFACE LEVEL	-0.69	5.23	5.55	7.88	8.27
OFFSET FROM CENTRELINE	-17.03	-10.25	-8.75	-2	0

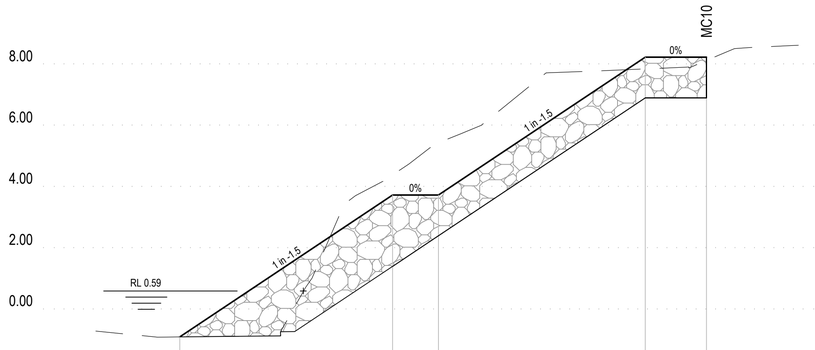
CH 75



DATUM R.L. -3.00

DESIGN SURFACE LEVEL	-1.638	3.987	3.987	8.487	8.487
DEPTH CUT - / FILL +	-1.18	-0.38	-2.61	0.05	-0.09
EXISTING SURFACE LEVEL	-0.46	4.37	6.59	8.44	8.57
OFFSET FROM CENTRELINE	-16.69	-8.25	-6.75	0	2

CH 60



DATUM R.L. -2.00

DESIGN SURFACE LEVEL	-0.907	3.724	3.724	8.224	8.224
DEPTH CUT - / FILL +	-0	-0.65	-1.71	0.38	0.1
EXISTING SURFACE LEVEL	-0.91	4.37	5.43	7.84	8.12
OFFSET FROM CENTRELINE	-17.20	-10.25	-8.75	-2	0

CH 70

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

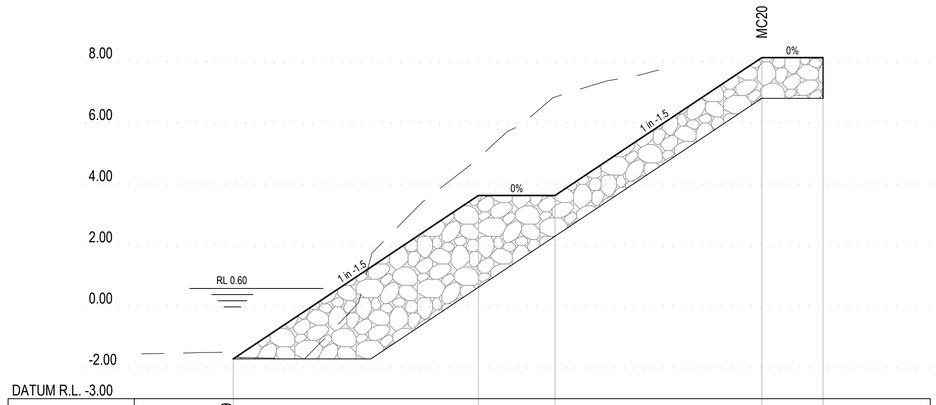
GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

Drawn J. BARCIAL | Designer D. TRUSS
Drafting Check G. DOUGHERTY* | Design Check G. NEWNHAM*
Approved (Project Director) J. TURNER*
Date 23.05.17
Scale 1:100
This Drawing must not be used for Construction unless signed as Approved

Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC10 SHEET 4

Original Size A1
Drawing No: 42-19890-C006
Rev: 0

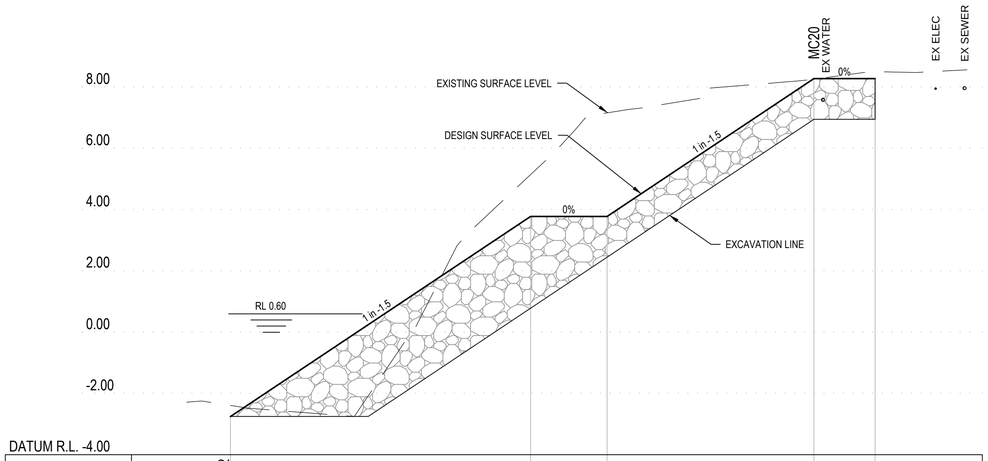
Plot Date: 23 May 2017 - 10:29 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C003-C006.dwg



DATUM R.L. -3.00

DESIGN SURFACE LEVEL	-1.699	3.638	3.638	8.138	8.138	
DEPTH CUT - / FILL +	-0.22	-1.22				
EXISTING SURFACE LEVEL	-1.48	4.86				
OFFSET FROM CENTRELINE	-17.26	-9.25	-6.75	0	2	

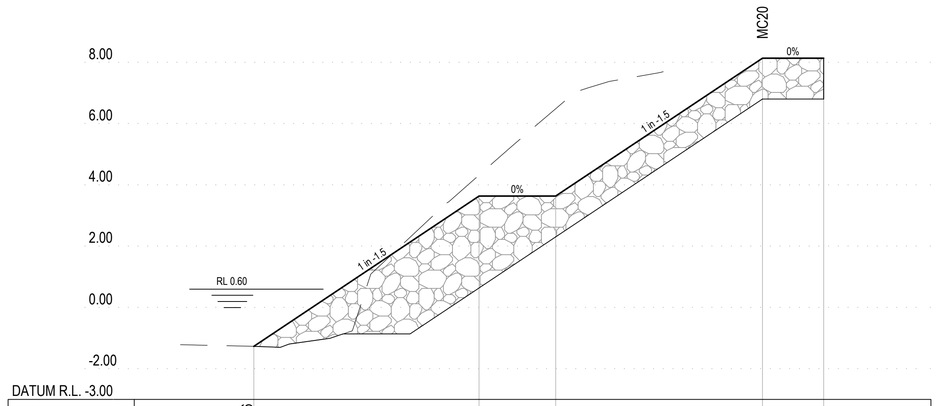
CH 5



DATUM R.L. -4.00

DESIGN SURFACE LEVEL	-2.752	3.78	3.78	8.28	8.28	
DEPTH CUT - / FILL +	-0.36	-1.36	-3.38	0.02	-0.22	
EXISTING SURFACE LEVEL	-2.39	5.14	7.16	8.26	8.5	
OFFSET FROM CENTRELINE	-19.05	-9.25	-6.75	0	2	

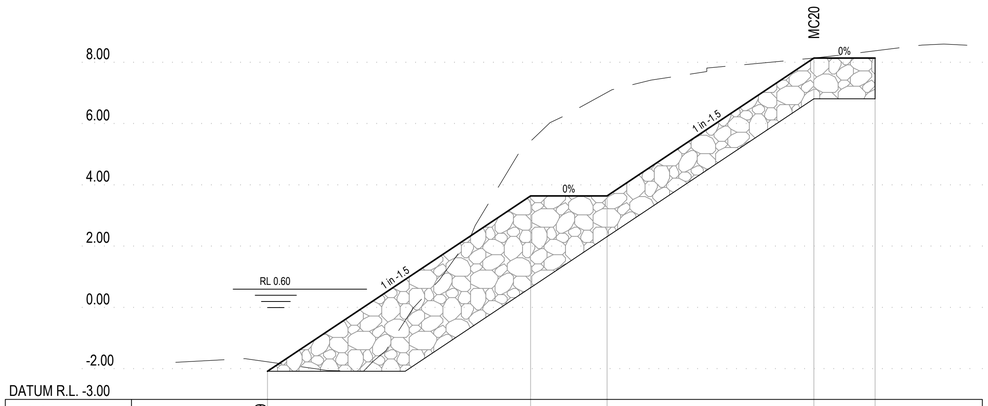
CH 15



DATUM R.L. -3.00

DESIGN SURFACE LEVEL	-1.266	3.638	3.638	8.138	8.138	
DEPTH CUT - / FILL +	-0	-0.69	-2.85			
EXISTING SURFACE LEVEL	-1.27	4.33	6.49			
OFFSET FROM CENTRELINE	-16.61	-9.25	-6.75	0	2	

CH 0



DATUM R.L. -3.00

DESIGN SURFACE LEVEL	-2.079	3.646	3.646	8.146	8.146	
DEPTH CUT - / FILL +	-0.31	-1.78	-3.38	0	-0.24	
EXISTING SURFACE LEVEL	-1.77	5.43	7.02	8.15	8.38	
OFFSET FROM CENTRELINE	-17.84	-9.25	-6.75	0	2	

CH 10

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

Drawn J. BARCIAL | Designer D. TRUSS
Drafting Check G. DOUGHERTY* | Design Check G. NEWNHAM*
Approved (Project Director) J. TURNER*
Date 23.05.17
Scale 1:100
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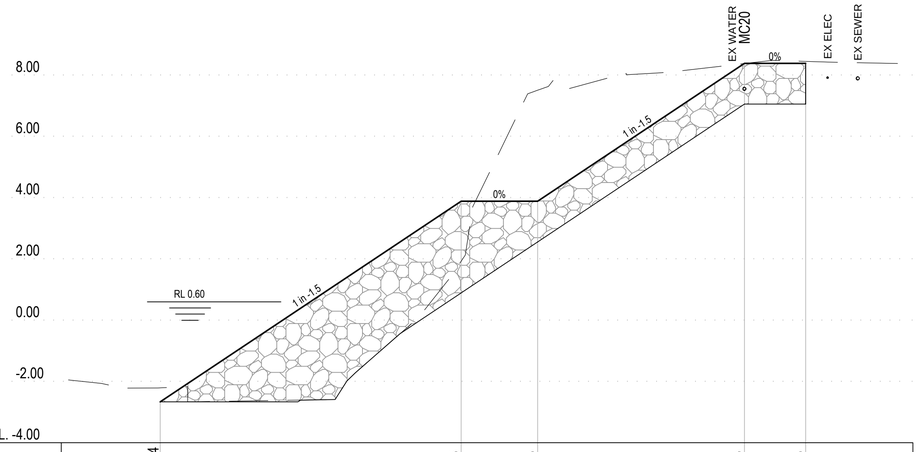
Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC20 SHEET 1

Original Size A1
Drawing No: 42-19890-C007
Rev: 0

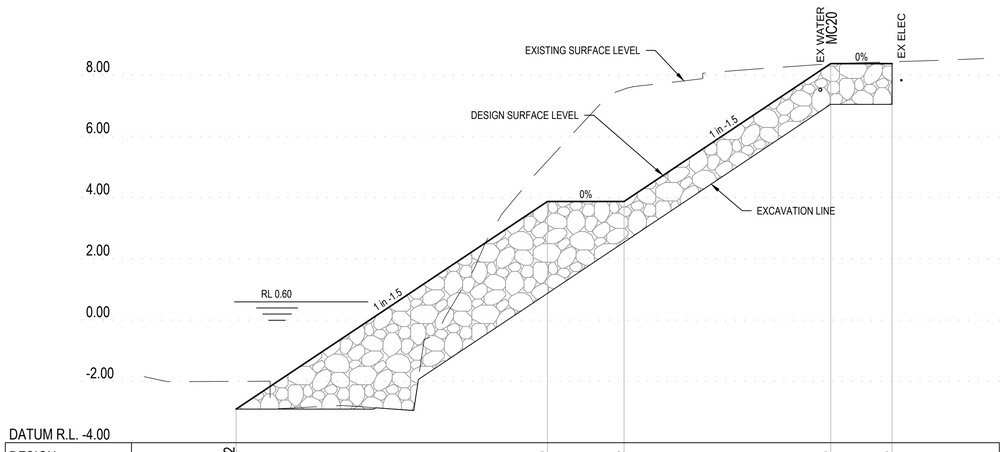
Plot Date: 23 May 2017 - 10:30 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C007-C011.dwg



DATUM R.L. -4.00

DESIGN SURFACE LEVEL	-2.664		3.885	3.885		8.385	8.385		
DEPTH CUT - / FILL +	-0.46		1.96	-3.62		0.01	-0.06		
EXISTING SURFACE LEVEL	-2.21		1.93	7.51		8.38	8.45		
OFFSET FROM CENTRELINE	-19.07		-9.25	-6.75		0	2		

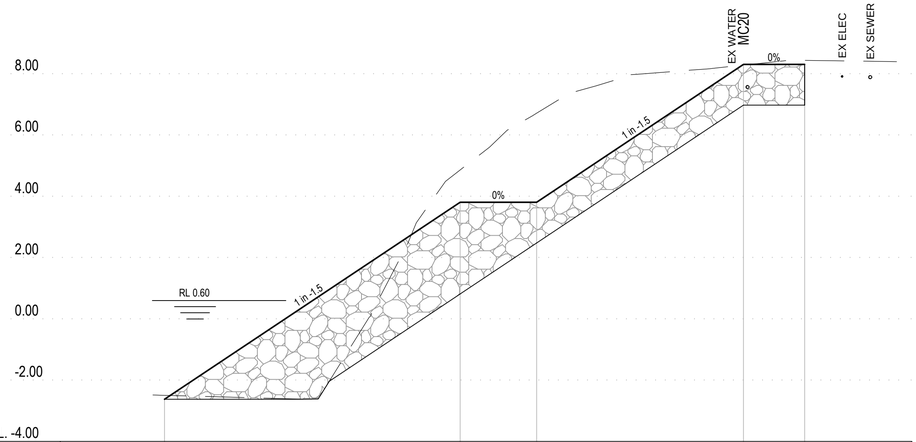
CH 25



DATUM R.L. -4.00

DESIGN SURFACE LEVEL	-2.902		3.875	3.875		8.375	8.375		
DEPTH CUT - / FILL +	-0.91		-1.32	-3.67		0	-0.06		
EXISTING SURFACE LEVEL	-2		5.2	7.54		8.37	8.44		
OFFSET FROM CENTRELINE	-19.41		-9.25	-6.75		0	2		

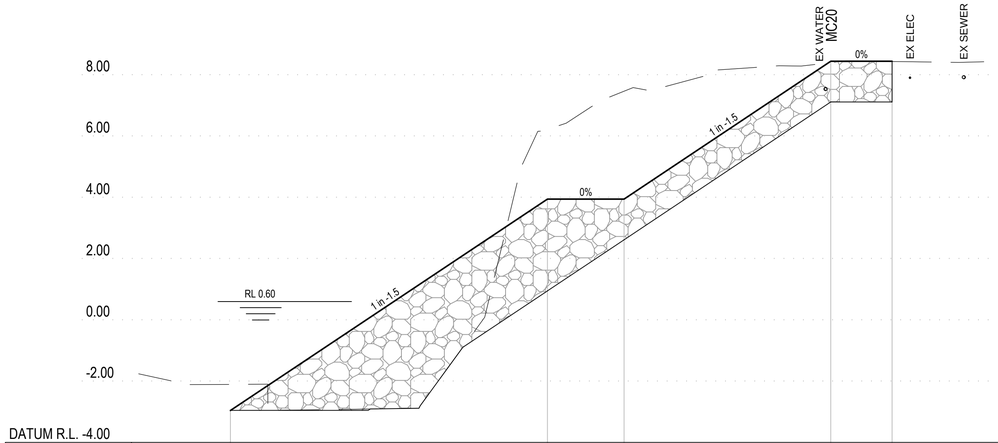
CH 35



DATUM R.L. -4.00

DESIGN SURFACE LEVEL	-2.623		3.81	3.81		8.31	8.31		
DEPTH CUT - / FILL +	-0.13		-1.05	-2.91		0.03	-0.13		
EXISTING SURFACE LEVEL	-2.49		4.86	6.72		8.28	8.44		
OFFSET FROM CENTRELINE	-18.9		-9.25	-6.75		0	2		

CH 20



DATUM R.L. -4.00

DESIGN SURFACE LEVEL	-2.955		3.945	3.945		8.445	8.445		
DEPTH CUT - / FILL +	-0.85		-2.28	-3.52		0.05	0.01		
EXISTING SURFACE LEVEL	-2.1		6.22	7.47		8.4	8.44		
OFFSET FROM CENTRELINE	-19.6		-9.25	-6.75		0	2		

CH 30

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

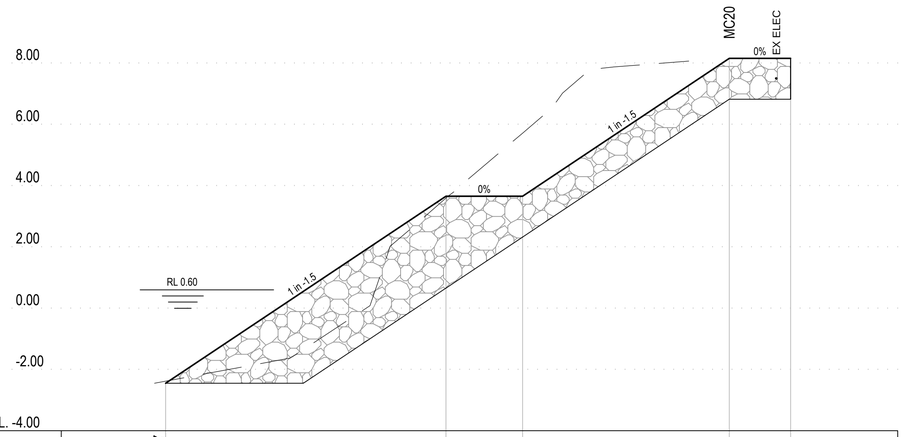
GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

Drawn J. BARCIAL | Designer D. TRUSS
Drafting Check G. DOUGHERTY* | Design Check G. NEWNHAM*
Approved (Project Director) J. TURNER*
Date 23.05.17
Scale 1:100
This Drawing must not be used for Construction unless signed as Approved

Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC20 SHEET 2

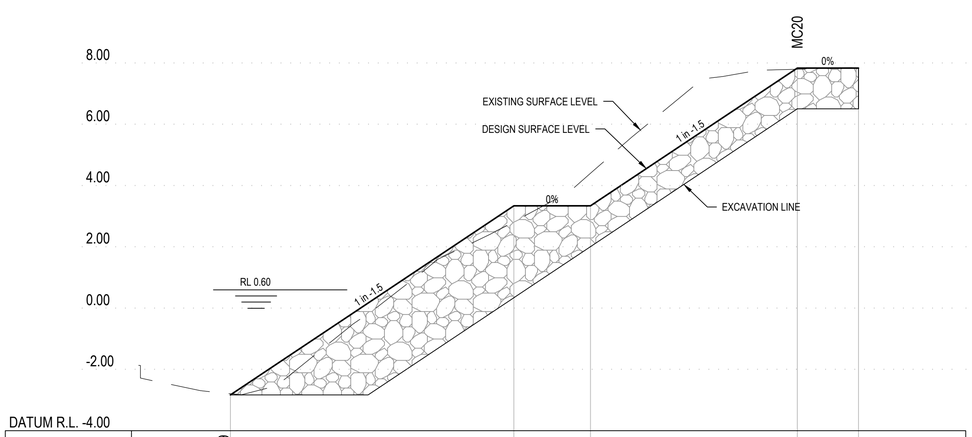
Original Size A1
Drawing No: 42-19890-C008
Rev: 0

Plot Date: 23 May 2017 - 10:30 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C007-C011.dwg



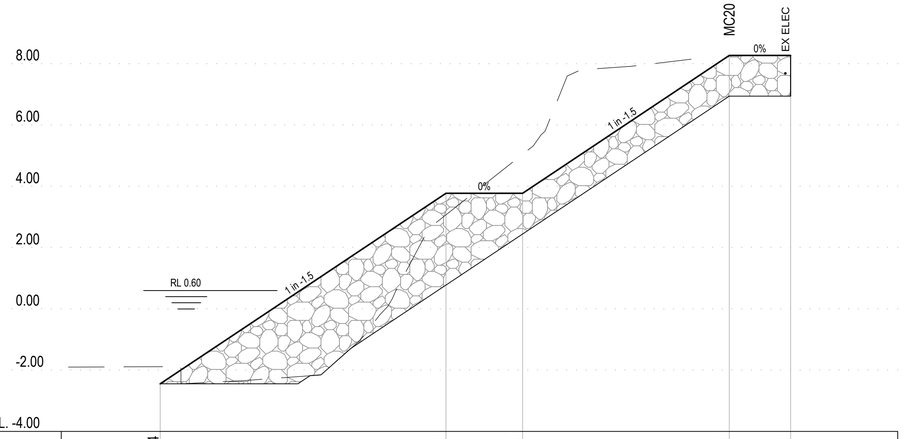
DATUM R.L. -4.00						
DESIGN SURFACE LEVEL	-2.447		3.654	3.654	8.154	8.154
DEPTH CUT - / FILL +	-0.07		0.06	-2.06		
EXISTING SURFACE LEVEL	-2.38		3.6	5.71		
OFFSET FROM CENTRELINE	-18.4		-9.25	-6.75	0	2

CH 45



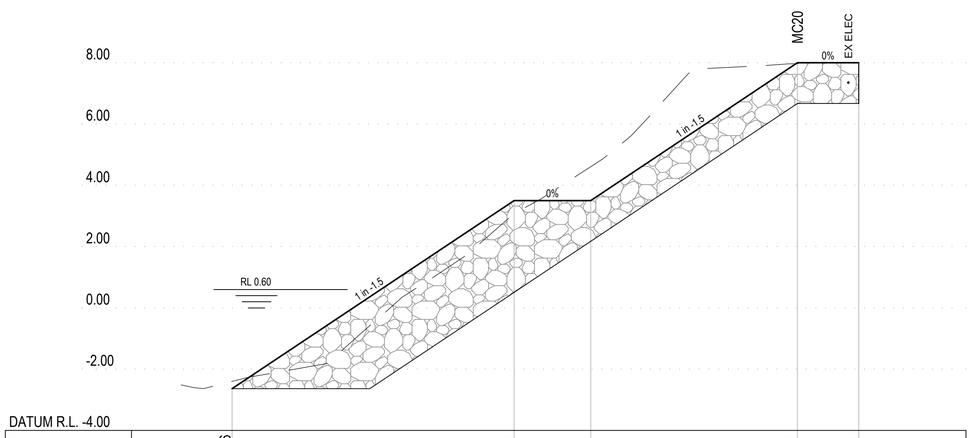
DATUM R.L. -4.00						
DESIGN SURFACE LEVEL	-2.829		3.341	3.341	7.841	7.841
DEPTH CUT - / FILL +	-0.04		0.51	-1.06	0.04	
EXISTING SURFACE LEVEL	-2.79		2.83	4.4	7.8	
OFFSET FROM CENTRELINE	-18.5		-9.25	-6.75	0	2

CH 55



DATUM R.L. -4.00						
DESIGN SURFACE LEVEL	-2.444		3.775	3.775	8.275	8.275
DEPTH CUT - / FILL +	-0.56		0.7	-1.27		
EXISTING SURFACE LEVEL	-1.88		3.07	5.05		
OFFSET FROM CENTRELINE	-18.58		-9.25	-6.75	0	2

CH 40



DATUM R.L. -4.00						
DESIGN SURFACE LEVEL	-2.636		3.503	3.503	8.003	8.003
DEPTH CUT - / FILL +	-0.24		0.43	-1.11	0.03	
EXISTING SURFACE LEVEL	-2.4		3.08	4.61	7.97	
OFFSET FROM CENTRELINE	-18.46		-9.25	-6.75	0	2

CH 50

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

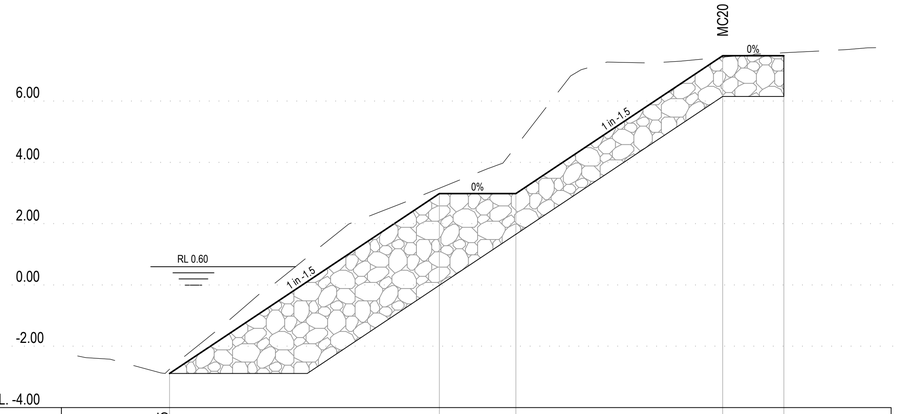
GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

Drawn	J. BARCIAL	Designer	D. TRUSS
Drafting Check	G. DOUGHERTY*	Design Check	G. NEWNHAM*
Approved (Project Director)	J. TURNER*		
Date	23.05.17		
Scale	1:100	This Drawing must not be used for Construction unless signed as Approved	

Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC20 SHEET 3

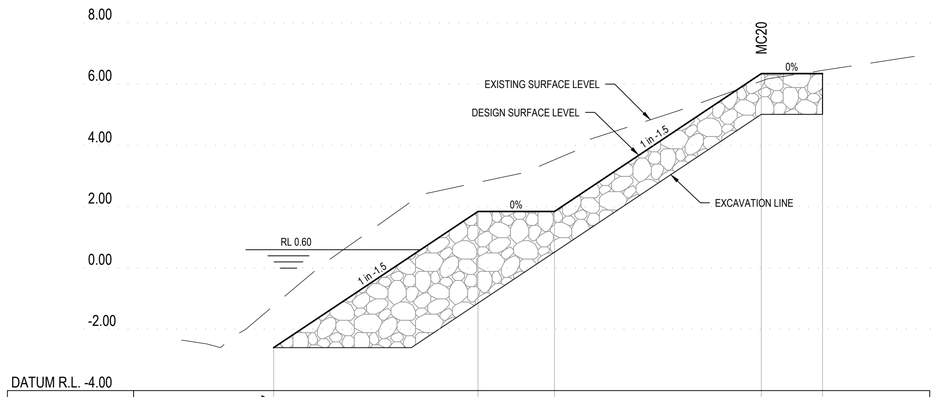
Original Size A1
Drawing No: 42-19890-C009
Rev: 0

Plot Date: 23 May 2017 - 10:31 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C007-C011.dwg



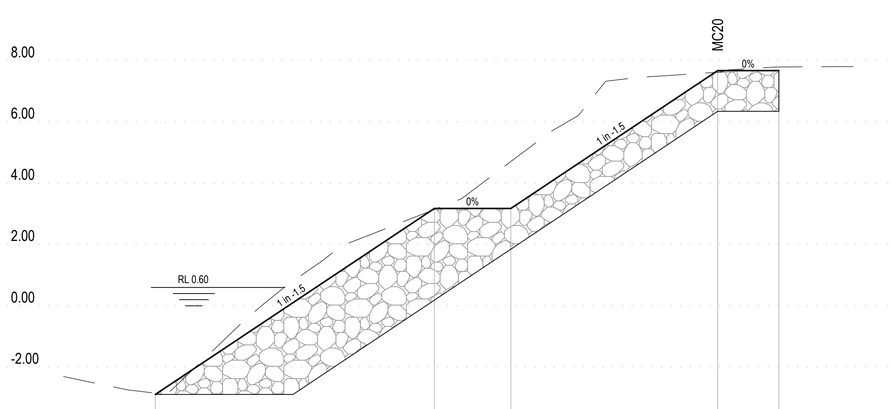
DATUM R.L. -4.00						
DESIGN SURFACE LEVEL	-2.885	2.987	2.987	7.487	7.487	
DEPTH CUT - / FILL +	-0.14	-0.17	-1.54	0.05	-0.1	
EXISTING SURFACE LEVEL	-2.75	3.16	4.53	7.44	7.58	
OFFSET FROM CENTRELINE	-18.06	-9.25	-6.75	0	2	

CH 65



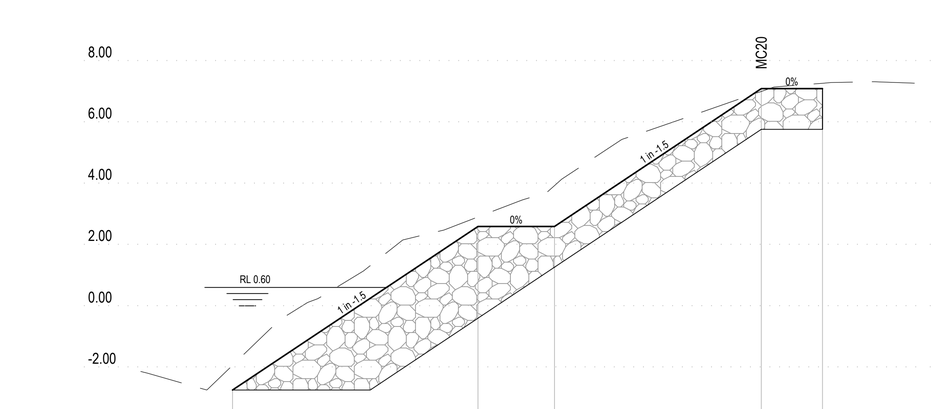
DATUM R.L. -4.00						
DESIGN SURFACE LEVEL	-2.597	1.85	1.85	6.35	6.35	
DEPTH CUT - / FILL +	-1.37	-0.95	-1.69	0.25	-0.1	
EXISTING SURFACE LEVEL	-1.23	2.8	3.54	6.1	6.45	
OFFSET FROM CENTRELINE	-15.92	-9.25	-6.75	0	2	

CH 75



DATUM R.L. -4.00						
DESIGN SURFACE LEVEL	-2.894	3.178	3.178	7.678	7.678	
DEPTH CUT - / FILL +	-0.04	0.03	-1.53	0.06	-0.12	
EXISTING SURFACE LEVEL	-2.85	3.15	4.71	7.62	7.8	
OFFSET FROM CENTRELINE	-18.36	-9.25	-6.75	0	2	

CH 60



DATUM R.L. -4.00						
DESIGN SURFACE LEVEL	-2.751	2.589	2.589	7.089	7.089	
DEPTH CUT - / FILL +	-0.81	-0.31	-1.33	0.09	-0.18	
EXISTING SURFACE LEVEL	-1.94	2.9	3.92	7	7.26	
OFFSET FROM CENTRELINE	-17.26	-9.25	-6.75	0	2	

CH 70

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

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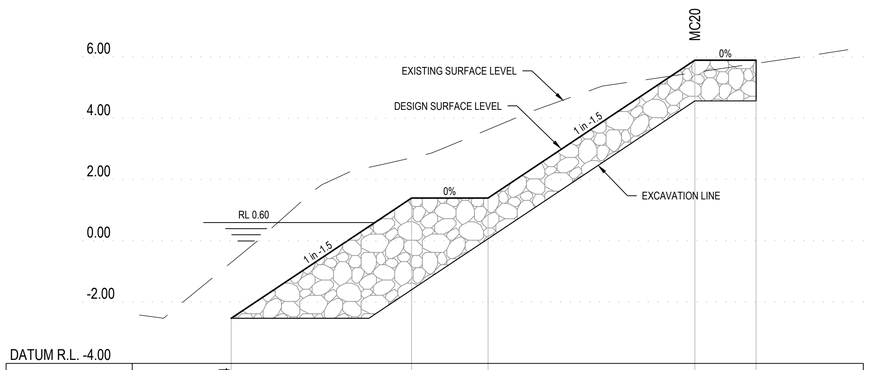
Drawn J. BARCIAL | Designer D. TRUSS
Drafting Check G. DOUGHERTY* | Design Check G. NEWNHAM*
Approved (Project Director) J. TURNER*
Date 23.05.17
Scale 1:100
This Drawing must not be used for Construction unless signed as Approved

Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC20 SHEET 4

Original Size A1
Drawing No: 42-19890-C010
Rev: 0

Plot Date: 23 May 2017 - 10:31 AM Plotted by: Romelson Lingan
Cad File No: G:\42\19890\CADD\Drawings\42-19890-C007-C011.dwg



DATUM R.L. -4.00

DESIGN SURFACE LEVEL	-2.524		1.4		1.4		5.9		5.9
DEPTH CUT - / FILL +	-1.82		-1.31		-2.24		0.4		0.11
EXISTING SURFACE LEVEL	-0.7		2.71		3.64		5.5		5.79
OFFSET FROM CENTRELINE	-15.14		-9.25		-6.75		0		2

CH 78

NOTE:
ALL ROCKFILL TO BE BENCHED AS PER TYPICAL SECTIONS DRAWING 42-19890-C002

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
0	FINAL ISSUE		NC	IB*	JT*	23.05.17

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Registered Professional G.NEWNHAM
Registration RPEQ
Registration Discipline GEOTECHNICAL
Signature G.NEWNHAM* No. 7452 Date 12.06.15

GHD
145 Ann St Brisbane QLD 4000 Australia
GPO Box 668 Brisbane QLD 4001
T 61 7 3316 3000 **F** 61 7 3316 3333
E bnemail@ghd.com **W** www.ghd.com

DO NOT SCALE

Drawn J. BARCIAL | Designer D. TRUSS
Drafting Check G. DOUGHERTY* | Design Check G. NEWNHAM*
Approved (Project Director) J. TURNER*
Date 23.05.17
Scale 1:100
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Client DOUGLAS SHIRE COUNCIL
Project MOSSMAN WWTP BANK STABILISATION
Title ANNOTATED SECTIONS - CONTROL LINE MC20 SHEET 5

Original Size A1
Drawing No: 42-19890-C011
Rev: 0

Plot Date: 23 May 2017 - 10:31 AM Plotted by: Romelson Lingan Cad File No: G:\42\19890\CADD\Drawings\42-19890-C007-C011.dwg

Appendix C – Land Titles

- **Lot 24 RP800985 (freehold)**
- **Lot 22 RP800895 (freehold)**
- **Lot 26 RP804231 (freehold)**

Appendix D – State Development Assessment Provisions

- **Module 5: Fisheries Resources (Module 5.2 Constructing or raising waterway barrier work in fish habitats)**
- **Module 10: Coastal Protection**

5.2 Constructing or raising waterway barrier works in fish habitats state code

Response column key:
☑ Achieved
P/S Performance solution
N/A Not applicable

Table 5.2.1: Operational work

Performance outcomes	Acceptable outcomes	Response	Comment
All assessable waterway barrier works			
PO1 The development will not increase the risk of mortality, disease or injury or compromise the health and productivity of fisheries resources.	**AO1.1** The development ensures that one or more of the following is achieved: (1) the waterway barrier works includes a fish way that adequately provides for the movement of fish across the barrier works, or (2) the movement of fish across the waterway barrier works is, adequately provided for in another way, or (3) the height of the waterway barrier works allows enough water to flow across the barrier works to adequately provide for the movement of fish across the barrier works, or (4) the waterway barrier works is intended to exist only for a temporary period, and the level of disruption to fish movement in the area is acceptable, or (5) it is not necessary or desirable, for the best management, use, development or protection of fisheries resources or fish habitats, for the waterway barrier works to provide for the movement of fish across the barrier works. **And**	☑	The works will consist of placing of rockfill on the banks of the Mossman and South Mossman Rivers laterally and will include the toe of the rockfill intruding into the bed of the rivers. It is estimated that the rockfill toe of the South Mossman River revetment wall will extend into the bed of the river varying from the base of the bank (i.e. not into the river bed) to a maximum of 2.8 m. The rockfill toe of the revetment wall on the Mossman River will extend to a maximum of 1 m into the bed of the river. These rockfill toe extensions provide only a partial barrier with the toe drowned out entirely during all flow events. The proposed construction will continue to allow fish passage upstream and downstream of the development and will not have any quantifiable impact on fisheries resources. The works are to protect the Mossman Wastewater Treatment Plant (MWTP).
	AO1.2 Suitable habitat conditions, such as water and sediment quality, will be maintained to sustain the health and condition of fisheries resources within all fish habitats. **And**	☑	During construction there will be a risk of increased turbidity as a result of earthworks, the degradation of water quality has the potential to impact on local fish habitats. Erosion and sediment controls including instream silt curtains will be implemented to mitigate the impacts of sediment on local water quality. These impacts are expected to be temporary and reversible i.e. post construction there will be no ongoing impacts from the works on fish habitats (any maintenance works will be managed in accordance with DSC procedures). Other aspects, e.g. potential for fuel spills and other potential water quality impacting issues will be addressed with the implementation of an Environmental Management Plan (EMP) for construction. A water quality monitoring program will be established during the construction period to ensure that water quality

Performance outcomes	Acceptable outcomes	Response	Comment
			objectives are met for the maintenance of habitat conditions conducive to sustaining the health and condition of fisheries resources.
	AO1.3 Cumulative effects of waterway barrier works do not impede fish movements, and will not affect reproductive success, health or mortality by depleting fish energy reserves. **And**	☑	The revetment works will not have any cumulative effect on fish movement. The Mossman River comprises an anastomosing reach of up to 230 m wide containing three channels, all of which provide for low flow conditions. There is a stream gauge on the Mossman River (531063) upstream of this reach and observations from the station indicates the Mossman River always maintains a base low flow, even during the dry season. The revetment works on the Mossman River (on the north-west side of the MWTP) partially extend onto the bed of the anabranch closest to the toe of the MWTP bank. Flow velocity calculations as part of the design criteria have identified that these works would not result in a measurable increase in low flow velocities at this point. At higher flows there will be no impacts and catadromous fish (and others in general) will not have to expend any additional energy reserves in migrating/moving upstream. The South Mossman River revetment works (on the south-east side of the MWTP) will extend to a maximum of 3 m into the bed of the river. Flow velocities on the South Mossman River are largely determined by downstream tidal influences, although at this location direct tidal fluctuations are absent, and limited due to no discernible slope gradient. At low flow events (i.e. dry season) the river may have no determinable flow on a flood or neap tide, with flows only on an outgoing tide. It is anticipated that constriction within the river bed by the revetment works will increase flows by up to 20% above the low flow. While this represents a significant flow increase based on percentage, in practical flow terms this is still a very low flow. At higher flows the impact of the revetment wall on flow velocities will be negligible. Functional fish groups observed (and known to occur) within this reach include eels, grunters, gobies/gudgeons, barramundi. Swimming/velocity data (Pusey *et al* 1995, Pusey and Kennard 1994, Bishop *et al* 2001) indicates that these groups have a very wide range of flow habitats, with migration occurring outside of low flow periods (i.e. lead up to the wet season), during periods when the revetment wall will not have a significant impact on flow velocities. The

Performance outcomes	Acceptable outcomes	Response	Comment
			revetment does not impose any constraint on fish species in terms of depleting energy resources for breeding.
	AO1.4 Fish will not become trapped or stranded as a result of development. **Or**	N/A	The revetment wall is parallel to and adjacent the main river flow and does not provide any obstacle that would trap or strand fish.
	AO1.5 Risks of fish stranding occurring have been identified and are demonstrably manageable.	N/A	As per AO1.4
PO2 Development maintains or enhances the community access to fisheries resources and fish habitats, through for example fishing access and linkages between commercial fisheries and infrastructure, services and facilities.	**AO2.1** The development does not impact on existing infrastructure or access required by commercial or recreational fishing.	N/A	Works are not near a public or commercial fishing boat ramp or access. Works are adjacent to MWTP. Recreational fishing can still occur on the Mossman and South Mossman Rivers as with the current situation.
PO3 Development that has the potential to impact on the operations and productivity of commercial or recreational fisheries mitigates any adverse impacts due to adjustment of fisheries. Editor's note: The Guideline on fisheries adjustment provides advice for proponents on relevant fisheries adjustment processes and is available by request from the Department of Agriculture and Fisheries.	**AO3.1** Affected fisheries and the impacts on those fisheries are identified. **And**	N/A	The project is not anticipated to impact on commercial or recreational fisheries.
	AO3.2 Fair and reasonable compensation to commercial fishers is determined. **And**	N/A	N/A
	AO3.3 The impact of the development on commercial fisheries and recreational fishers is mitigated.	N/A	N/A
PO4 When the purpose of a waterway barrier is no longer relevant, or the design life of the structure is complete and the structure is not intended to be re-lifed, the waterway barrier will be removed.	**AO4.1** At the end of the viable operation of the development, the waterway barrier (and where appropriate any fish way) will be removed from the waterway and fish habitats and fish passage will be reinstated to previous or better levels. **Or**	☑	The revetment walls will be permanent bank structures to provide ongoing protection to the MWTP. Post construction any temporary structure used within the waterway (i.e. the floating work platform) will be removed.
	AO4.2 If the barrier remains in place, fish passage provision in accordance with the approved design and operation is maintained as long as the barrier remains.	☑	Fish passage will not be adversely impacted by the revetment structures. Some flow increases during dry season low flow events are expected as a result of the South Mossman River revetment structure extending up to a maximum of 3 m into the river bed. However, this will not significantly obstruct fish passage as the increase in flow velocities is minimal and will remain within the habitat range for the fish groups observed and known to occur in the rivers.

Performance outcomes	Acceptable outcomes	Response	Comment
PO5 Development demonstrates appropriate rights and an overriding public need for the development, including consideration of any impacts beyond the footprint of the constructed development. Editor's note: For example, dams and weirs affect fish habitats up and downstream from the structure by pooling and restricting water flows.	**AO5.1** The development is supported by a statutory instrument (for example, regional plans made under the Act, Shoreline Erosion Management Plan (SEMP), coordinated project approval under the State Development and Public Works Organisation Act 1971), and the impact on fish habitats have been properly considered. **And**	P/S	Riverbank stabilisation works are essential maintenance works to failed sections of the Mossman and Mossman South Rivers adjacent to MWTP. A Development Approval is being sought.
	AO5.2 The following can be demonstrated: (1) tenure is held for the land directly abutting the waterway where the works will be carried out and has the applicant has full riparian access rights on both sides of the barrier (2) tenure has been granted over the area of work, or (3) resource allocation or resource entitlement has been granted for the resource being developed. **And**		The Project is being conducted by Douglas Shire Council (DSC). Owners consent has been sought as part of the Development Application. Where works fall on freehold land appropriate approvals form the landholders are being sought by DSC. The works will not require an Allocation of Quarry Material.
	AO5.3 Development is for public infrastructure. **Or**	☑	As per AO5.4
	AO5.4 Development is for public infrastructure for which there is no alternative viable route that does not require waterway barrier works. **Or**	☑	MWTP requires bank stabilisation to secure infrastructure from breaches and system failures, including the collapse of infrastructure into the South Mossman River. There are no feasible alternatives to the development.
	AO5.5 Development is for a legitimate public health or safety issue and the applicant is an entity or acting on behalf of an entity.	☑	Riverbank erosion is adjacent to MWTP. Boundary fences to the STP are now collapsing. This is a public health and safety hazard due to the close proximity of treatment lagoons, oxidation ditch and clarifier to the South Mossman River bank crest and the very high risk of potential collapse of infrastructure into the river. In many instances much of the existing infrastructure is less than 10 m from the failing fence/eroding banks.
PO6 Development minimises stream crossings.	**AO6.1** Where multiple waterway barrier works are demonstrated to be essential, these are located a minimum of 100 metres apart (including existing structures).	N/A	The development is riverbank stabilisation works. Ongoing riverbank erosion on a section of the Mossman River and a separate section of the South Mossman River adjacent to MWTP. Revetment works are not on the same watercourse.
PO7 Development avoids non-essential hardening or unnatural modification of channels.	**AO7.1** The development does not involve the channelisation of meandering waterways. **And**	N/A	No modification to the existing channels are proposed. The proposed hardening of the river banks is essential to the revetment stabilisation works.

Performance outcomes	Acceptable outcomes	Response	Comment
	AO7.2 Where channels need to be significantly modified, the development simulates natural watercourses by including meanders, pools, riffles, shaded and open sections, deep and shallow sections, and different types of substrata. Natural features such as rock outcrops and boulders are retained or recreated.	N/A	Channels will not be modified. Works proposed are to the existing riverbanks.
PO8 Impacts on water quality in declared fish habitat areas are minimised.	**AO8.1** Development involves erosion and sediment control measures. Editor's note: Erosion and sediment control should be in accordance with the Best practice erosion and sediment control guidelines, International Erosion Control Association Australasia, 2008.	N/A	The development is not a declared fish habitat area. A suitably qualified person shall prepare an Erosion and Sediment Control Plan that will be implemented. The Plan will be developed in accordance with IECA guidelines, with regard to the site specific factors encountered at the works sites.
PO9 Development resulting in drainage or disturbance of acid sulfate soil is managed to prevent impacts on fisheries resources and fish habitats.	**AO9.1** Run-off and leachate from disturbed or oxidised acid sulfate soils is contained, treated and not released to a waterway or other fish habitat in accordance with the Queensland acid sulfate soils technical manual: Soil management guidelines, Department of Natural Resources and Mines, 2002.	P/S	The site revetment works will occur at LAT 1.58 m to vary the channel bed for wall stabilisation. It will then extend above HAT 1.78 m to the existing fenceline of the MWTP. Acid sulfate soils will be addressed in the Contractor EMP as a requirement, in the event that acid sulfate soils are exposed as part of the riverbank stabilisation works. Reference will be made to the Queensland Acid Sulfate Soil Technical Manual.
All development – environmental offsets			
PO10 Impact to fish passage or legally secured offset areas for fish passage is avoided, or mitigated and an environmental offset is provided for any significant residual impact.	**AO10.1** Residual impact to fish passage or legally secured offset areas for fish passage, including the fisheries resources and fish habitat they contain, is comprehensively and accurately documented to demonstrate that impact is avoided or, where this cannot be achieved, that impacts are minimised. **Or**	☑	It is not considered that there will be an impact to fish passage as a result of these works. As a result there are no anticipated residual impacts to fish passage, and thus it is environmental offset is not considered to be required.
	AO10.2 Where residual impact to fish passage or legally secured offset areas for fish passage, including the fisheries resources and fish habitats they contain, is accurately documented and it cannot be demonstrated that impact can be reasonably avoided or minimised, an environmental offset is provided for any significant residual impact. Editor's note: Applications for development should identify whether there is likely to be a significant residual impact and a need for an environmental offset having regard to Section 3.8 (Waterway providing for fish passage) of the Significant Residual	N/A	As per AO10.1

Performance outcomes	Acceptable outcomes	Response	Comment
	Impact Guideline and the relevant Queensland Environmental Offsets Policy.		
Incorporation of fish ways			
PO11 Where the waterway barrier works will be a barrier to fish movement, provisions are made for adequate fish movement by incorporating a fish way or fish ways for the works.	No acceptable outcome is prescribed.	☑	It is not anticipated that fish movement will be impacted by the riverbank stabilisation works. Therefore any further fishways do not need to be provided.
PO12 Any fish way proposed as part of the development is demonstrated to be a feasible and reliable solution that will provide adequate fish passage. Editor's note: Further information about the importance of fish passage and design considerations can be found in the book From sea to source: International guidance for the restoration of fish migration highways.	**AO12.1** A person or entity that is suitably qualified and experienced in fish passage biology and fish way design and delivery demonstrates and verifies that any fish way design will provide adequate fish passage. **And**	N/A	No fishways are proposed.
	AO12.2 Development uses a fish way design that has been successfully implemented under similar conditions (such as flows and fish communities) and has been demonstrated to provide adequate fish passage through actual scientific monitoring. **And**	N/A	No fishways are proposed.
	AO12.3 Development provides for the installation of monitoring equipment, such as traps and lifting equipment, access for monitoring, and a monitoring program of sufficient rigour to: (1) demonstrate the success of the fish way and fish passage at the site (2) provide the basis for optimising operation of the works and fish way. **And**	N/A	No fishways are proposed.
	AO12.4 The fish way design maximises flexibility for future adjustments that may be needed once in place. **And**	N/A	No fishways are proposed.
	AO12.5 The owner or operator demonstrates the means and commitment to promptly rectify any faults found in the fish way during commissioning, monitoring and operation, if these lead to inadequacies in the fish movement that are provided. **And**	N/A	No fishways are proposed.

Performance outcomes	Acceptable outcomes	Response	Comment
	AO12.6 Any tailwater control structures such as a gauging weir, rock bar or stream crossings are fitted with a fish way or designed to allow fish passage. **And**	N/A	No fishways are proposed.
	AO12.7 Any existing in-stream structure downstream of the proposed waterway barrier works, which increases the barrier effect to fish passage through changes in flow characteristics, is fitted with adequate fish passage facilities.	N/A	No fishways are proposed.
PO13 Lateral (upstream and downstream) and longitudinal fish movement is provided for.	**AO13.1** More than one fish way is provided, for example, to provide up and downstream fish passage or to provide fish passage under a range of flow regimes.	N/A	No fishways are proposed.
PO14 Any fish way is be capable of operating whenever there is flow in the waterway (inflow or release), the dam is above dead storage level, and the fish way will be operational for as long as the waterway barrier is in position.	**AO14.1** The operational range of a fish way is sufficient having regard to the hydrology of the site and the fish movement characteristics (in particular timing of movements in relation to seasons and hydrographs). **And**	NA	No fishways are proposed.
	AO14.2 The lower operational range of the fish way is down to at least 0.5 metres below minimum headwater drawdown level (dead storage or minimum off-take level, whichever is lower) and to at least 0.5 metres below minimum tail water level at the site. **And**	N/A	No fishways are proposed.
	AO14.3 Upstream and downstream fish ways will be operated whenever there are inflows into the impoundment or release out of the impoundment, and during overtopping events. **And**	N/A	No fishways are proposed.
	AO14.4 All releases are directed firstly through the fish way as a priority over the outlet works, with the fish way being operated whenever a release is made through it, regardless of whether the release volume is less than the optimal minimum release for fish way operation. **And**	N/A	No fishways are proposed.
	AO14.5 The fish way is designed such that non-operation duration (for example, less than two weeks) and incidents due to maintenance issues (for example, siltation, debris, breakdowns, sourcing of parts) are minimised.	N/A	No fishways are proposed.

Performance outcomes	Acceptable outcomes	Response	Comment
	And		
	AO14.6 Fish ways are monitored and maintained to ensure that the fish way is operational at all times.	N/A	No fishways are proposed.
PO15 Any fish way, and all associated componentry are designed to be durable, reliable and adequately protected from damage from high flow and flood events, to prevent or minimise non-operation.	**AO15.1** Development ensures that mechanisms are in place to ensure that operational issues in fish ways are promptly rectified for the life of the fish way. **And**	N/A	No fishways are proposed.
	AO15.2 The quality of materials and components for construction of the fish way are appropriate for the intended service life of the fish way.	N/A	No fishways are proposed.
PO16 Any fish way is located in a position and manner that maximise the attraction and movement of fish, while also enabling access for monitoring, maintenance and operating purposes.	**AO16.1** Modelling demonstrates, by showing the likely flow patterns and adjacent to the fish way entrance that the location of the fish way entrance is optimal for fish attraction across the operational range of the fish way. **And**	N/A	No fishways are proposed.
	AO16.2 Outlet works are adjacent to the fish way, but are positioned and designed so as not to interfere with fish access and attraction to the fish way entrance during outlet releases. **And**	N/A	No fishway or outlet works being provided.
	AO16.3 Spillway overtopping flows initiate and terminate adjacent to the fish way or are directed parallel to the fish way entrance. **And**	N/A	No fishways are proposed.
	AO16.4 Spillway flows are transferred to fish way releases as soon as possible during a flow recession. **And**	N/A	No fishways are proposed.
	AO16.5 There is a continuous attraction flow at all times at the fish way entrance when the fish way is operating. **And**	N/A	No fishways are proposed.
	AO16.6 Attraction flow velocities are sufficient and variable to attract the whole fish community. **And**	N/A	No fishways are proposed.
	AO16.7 Appropriate light levels are maintained at fish way entrances.	N/A	No fishways are proposed.

Performance outcomes	Acceptable outcomes	Response	Comment
	And		
	AO16.8 Additional means of fish attraction are included in the fish way design if appropriate. **And**	N/A	No fishways are proposed.
	AO16.9 The fish way entrance is accessible under all flow conditions within its operating range. **And**	N/A	No fishways are proposed.
	AO16.10 Fish attracted to the spillway are able to access the fish way without having to swim back downstream. **And**	N/A	No fishways are proposed.
	AO16.11 Water supply for the fish ways and attraction flows are sourced from surface quality water or equivalent quality water. **And**	N/A	No fishways are proposed.
	AO16.12 There are adequate holding chamber dimensions for the fish biomass (for lock, lift, trap and transfer type fish ways). **And**	N/A	No fishways are proposed.
	AO16.13 The fish way has adequate hydraulic conditions for all fish within and throughout the fish ways.	N/A	No fishways are proposed.
PO17 The seasonal and flow-related biomass of the fish community at the location of the waterway barrier works has been surveyed, and has been catered for in the design of the fish way.	**AO17.1** The fish way design, operation and capacity will avoid or acceptably minimise failure to pass any members of the fish community, for example, due to size, class or swimming ability. **And**	N/A	No fishways are proposed.
	AO17.2 Future increases in fish biomass are quantified and catered for in the design of the fish way (for example, in capacity or flexibility of operation).	N/A	No fishways are proposed.
PO18 Fish ways and other means of fish passage at waterway barrier works cater for the whole fish community taking into account species, size classes, life-stages and swimming abilities.	**AO18.1** The seasonal and flow-related composition of the fish community at the location of the waterway barrier works is well understood and catered for. **And**	N/A	No fishways are proposed.
	AO18.2 The fish way design, operation and capacity will avoid or acceptably minimise any delays in fish movement.	N/A	No fishways are proposed.

Performance outcomes	Acceptable outcomes	Response	Comment
PO19 Development does not increase the risk of mortality, disease or injury, or compromise the health and productivity in fish.	**AO19.1** All pathways providing fish passage at a proposed waterway barrier works are safe for fish to pass. **And**	N/A	No fishways are proposed.
	AO19.2 Fish passage will not adversely impact on the wellbeing of fish. **And**	N/A	No fishways are proposed.
	AO19.3 The designs of all components of waterway barriers, including but not limited to spillway, stilling basin, apron and dissipation structures, are developed and implemented with safe downstream fish passage as a key design consideration. Note: A stepped spillway (including sheet pile weirs) is not an acceptable solution as high mortalities and injuries to fish have been associated with such designs. **And**	N/A	No fishways are proposed.
	AO19.4 There is adequate minimum tailwater depth at the toe of the spillway (for example, stilling basin) at commencement to spill (for example, 30 per cent of the head difference). **And**	N/A	No spillway to be constructed.
	AO19.5 Intake and outlet works adjacent to the waterway barrier are screened or otherwise designed and placed to prevent fish passing through or becoming trapped in these works. **And**	N/A	No intake or outlets works proposed.
	AO19.6 Intake screen dimensions are such that small fish are not drawn through the outlet works and velocities are low enough that fish are not impinged or entrained on the screens. **And**	N/A	No intake or outlets works proposed.
	AO19.7 The fish way exit is located so as to avoid entrainment in any outlet work screens and avoid fish being washed back over the spillway during overtopping. **And**	N/A	No fishway to be installed.
	AO19.8 Cover is provided for fish moving from the exit. **And**	N/A	There is natural cover from vegetation along the banks of Mossman and South Mossman Rivers.

Performance outcomes	Acceptable outcomes	Response	Comment
	AO19.9 Fish exit upstream and downstream fish ways at the water level over the full range of tailwater and headwater levels. **And**	N/A	No fishway to be installed.
	AO19.10 Trash and debris are excluded from the upstream fish way exit and downstream fish way entrance with designs that ensure that fish can access the exits and entrances, and that the fish way(s) are not blocked or damaged by trash or debris. **And**	N/A	No fishways are proposed.
	AO19.11 Adequate minimum depth is maintained through the fish way. **And**	N/A	No fishways are proposed.
	AO19.12 The risk of fish kills arising from the works are minimised (for example, through entrapment of fish upstream or between works). **And**	N/A	No fishways are proposed.
	AO19.13 Contingency plans in case of mechanical or electrical failure of fish ways are in place. **And**	N/A	No fishways are proposed.
	AO19.14 The fish way design, operation and capacity will avoid or acceptably minimise predation within and upon the fish community using the fish way.	N/A	No fishways are proposed.
Inherent barrier design and provision of fish passage			
PO20 Fish passage is provided for: (1) in the inherent design of the waterway barrier works (2) over the in-situ life of the barrier in that position through adequate construction and maintenance of the barrier.	**AO20.1** Development avoids or minimises loss of, or modification to, fish habitat. **And**	☑	Barrier works are riverbank stabilisation works only with a floating platform used to house the excavator during earthworks. Fish habitat is expected to be minimally impacted.
	AO20.2 The drownout characteristics of the waterway barrier allow for adequate fish passage at the site. **And**	N/A	Drownout is not considered an aspect with regards to riverbank stabilisation works.
	AO20.3 At drownout, the conditions at the barrier are such that: (1) the tailwater and headwater levels across the weir are essentially equal	N/A	Item 4 applies. Adequate fish passage to be provided as works do not extend from bank to bank on either Mossman or South Mossman Rivers.

Performance outcomes	Acceptable outcomes	Response	Comment
	(2) velocities are sufficiently low for fish passage (e.g. 0.3 metres/second) at or close to the edge of the spillway crest (3) the weir is fully submerged to a sufficient depth to allow for fish passage, and for the species and size classes of fish moving through the site to cross the weir (4) to the degree that provides for adequate fish passage at the site. **And**		
	AO20.4 The frequency, timing and duration of drownout conditions are adequate for the movement requirements of the fish community moving past the barrier. **And**	N/A	As per AO20.1
	AO20.5 Delays to fish passage when there are flows in the system but no fish passage in the rising hydrograph are accurately defined for the design, and avoided or limited to a maximum of three days. **And**	N/A	As per AO20.1
	AO20.6 In assessing whether the inherent barrier design provides adequate fish passage, impacts on lateral and longitudinal fish movement are considered.	N/A	As per AO20.1
PO21 The use of floodgates is avoided or minimised.	**AO21.1** There is an overriding need for new floodgates, and other alternatives are unviable. **And**	N/A	Floodgates are not being installed as part of the works. The Project is riverbank stabilisation / revetment only.
	AO21.2 Hydraulic conditions through the floodgates are adequate for fish passage. **And**	N/A	
	AO21.3 Floodgates are designed and operated as (tidally activated) automatic floodgates. **And**	N/A	
	AO21.4 The invert of the floodgate is at bed level. **And**	N/A	
	AO21.5 Floodgates allow for fish passage over an adequate duration of the tidal cycle. **And**	N/A	

Performance outcomes	Acceptable outcomes	Response	Comment
	AO21.6 The operation of the floodgate will not result in impacts on water quality that may impact on fish or fish habitat.	N/A	
PO22 Waterway barriers that are bridges are designed, constructed and maintained to provide adequate fish passage for the site and: (1) fish passage is provided for the life of the crossing (2) hydraulic conditions (depth, velocities and turbulence) from the downstream to the upstream limit of the structure allow for fish passage of all fish attempting to move through the crossing at all flows up to the drownout of the structure. Editor's note: For guidance on when a bridge is and is not considered to be waterway barrier work see the Department of Agriculture, Fisheries and Forestry 2014 fact sheets Maintaining Fish Passage in Queensland: What is a Waterway Barrier Work? What is not a Waterway Barrier Work?	**AO22.1** A bridge that is designed to allow adequate fish passage is preferentially installed to a culvert. **And**	N/A	No bridges are proposed as part of riverbank stabilisation works on the Mossman and South Mossman Rivers adjacent to the MWTP.
	AO22.2 In-stream bridge structures such as piles are minimised. **And**	N/A	
	AO22.3 Bridge support piles are not constructed within the low-flow channel or so that they constrict the edges of the low-flow channel. **And**	N/A	
	AO22.4 Bridge abutments do not extend into the waterway beyond the toes of the banks. **And**	N/A	
	AO22.5 Bank revetment works do not extend into the waterway beyond the toes of the banks. **And**	N/A	
	AO22.6 Permanent access or erosion control structures within the main channel adjacent to the bridge are set at or below bed level, roughened to approximately simulate natural bed conditions, and maintained so that there are no drops in elevation at their edges or joins with the stream bed.	N/A	
PO23 Waterway barriers that are culverts provide adequate fish passage for the site, and: (1) fish passage is provided for the life of the crossing (2) hydraulic conditions (depth, velocities and turbulence) from the downstream to the upstream limit of the structure allow for fish passage of all fish attempting to move through	**AO23.1** Culverts are only installed where the site conditions do not allow for a bridge. **And**	N/A	No culverts apply to these works.
	AO23.2 The combined width of the culvert cell apertures are equal to 100 per cent of the main channel width. **And**	N/A	No culverts apply to these works.
	AO23.3 The culvert crossing and associated erosion protection structures are installed at no steeper gradient than the waterway bed gradient. **And**	N/A	No culverts apply to these works.

Performance outcomes	Acceptable outcomes	Response	Comment
the crossing at all flows up to the drownout of the structure. Editor's note: For guidance see the Department of Agriculture, Fisheries and Forestry 2014 Fact Sheet Maintaining Fish Passage in Queensland: What is a Waterway Barrier Work?	**AO23.4** For the life of the culvert crossing, relative levels of the culvert invert, apron and scour protection and the stream bed are kept so that there are no drops in elevation at their respective joins. **And**	N/A	No culverts apply to these works.
	AO23.5 The base of the culvert is: (1) buried a minimum of 300 millimetres to allow bed material to deposit and reform the natural bed on top of the culvert base, or (2) the base of the culvert is the stream bed, or (3) the base of the culvert cell is roughened throughout the culvert floor to approximately simulate natural bed conditions. **And**	N/A	No culverts apply to these works.
	AO23.6 The outermost culvert cells incorporate roughening elements such as baffles on their bankside sidewalls. **And**	N/A	No culverts apply to these works.
	AO23.7 Roughening elements are installed on the upstream wingwalls on both banks to the height of the upstream obvert or the full height of the wingwall. **And**	N/A	No culverts apply to these works.
	AO23.8 Roughening elements provide a contiguous lower velocity zone (no greater than 0.3 metres/second) for at least 100 millimetres width from the wall through the length of the culvert and wingwalls. **And**	N/A	No culverts apply to these works.
	AO23.9 In-stream scour protection structures are roughened throughout to approximately simulate natural bed conditions. **And**	N/A	No culverts apply to these works.
	AO23.10 Culvert alignment to the stream flow minimises water turbulence. **And**	N/A	No culverts apply to these works.

Performance outcomes	Acceptable outcomes	Response	Comment
	AO23.11 There is sufficient light at the entrance to and through the culvert so that fish are not discouraged by a sudden descent into darkness. **And**	N/A	No culverts apply to these works.
	AO23.12 The depth of cover above the culvert is as low as structurally possible, except where culverts have an average recurrence interval (ARI) greater than 50 years. **And**	N/A	No culverts apply to these works.
	AO23.13 For culvert crossings designed with a flood immunity >ARI 50, fish passage is provided up to culvert capacity. **And**	N/A	No culverts apply to these works.
	AO23.14 Adequate design (for example, culvert aperture) and maintenance measures are in place for the life of the crossing to keep crossings clear of blockages through a regular inspection program in order to retain fish passage through the crossing. **And**	N/A	No culverts apply to these works.
	AO23.15 Crossings within the bed and banks do not incorporate culverts.	N/A	No culverts apply to these works.
PO24 Waterway crossings other than bridges or culverts provide adequate fish passage for the site and: (1) fish passage is provided for the life of the crossing (2) hydraulic conditions (depth, velocities and turbulence) from the downstream to the upstream limit of the structure allow for fish passage of all fish attempting to move through the crossing at all flows up to the drownout of the structure. Editor's note: For guidance on when a waterway crossing is not considered to be waterway barrier work see the Department of Agriculture, Fisheries and Forestry 2014 fact sheet Maintaining Fish Passage in	**AO24.1** The crossing is built at or below bed level so that the surface of the crossing is no higher than the stream bed at the site. **And**	N/A	No waterway crossing is proposed.
	AO24.2 For the life of the crossing, relative levels of the crossing, any bed erosion or scour protection and the stream bed are kept so that there are no drops in elevation at their respective joins. **And**	N/A	No waterway crossing is proposed.
	AO24.3 The crossing and associated erosion protection structures are installed at no steeper gradient than the waterway bed gradient. **And**	N/A	No waterway crossing is proposed.
	AO24.4 The crossing and associated erosion protection structures are roughened throughout to approximately simulate natural bed conditions.	N/A	No waterway crossing is proposed.

Performance outcomes	Acceptable outcomes	Response	Comment
Queensland: What is not a Waterway Barrier Work?	**And**		
	AO24.5 The lowest point of the crossing is installed at the level of the lowest point of the natural stream bed (pre-construction), within the footprint of the proposed crossing. **And**	N/A	No waterway crossing is proposed.
	AO24.6 There is a height difference from the lowest point of the crossing to the edges of the low flow section of the crossing to channel water into the low flow section. **And**	N/A	No waterway crossing is proposed.
	AO24.7 The level of the remainder of the crossing is no higher than the lowest point of the natural stream bed outside of the low flow channel.	N/A	No waterway crossing is proposed.
PO25 All waterway barriers are designed, constructed and maintained to provide adequate fish passage for the site and fish passage is provided for the life of the barrier.	**AO25.1** Hydraulic conditions (depth, velocities and turbulence) from the downstream to the upstream limit of the structure allow for fish passage of all fish attempting to move through the barrier at all flows up to the drownout of the structure. **And**	N/A	No full waterways barriers are proposed to be installed. The Project is riverbank revetment works only, which is not anticipated to provide any barriers to fish passage.
	AO25.2 Aperture size of openings (for example, at screens or trash racks) ensures adequate fish passage. **And**	N/A	No waterway crossing is proposed.
	AO25.3 Hydraulic conditions are such that adequate fish passage is provided. **And**	N/A	No waterway crossing is proposed.
	AO25.4 Flows across, or releases out of, the structure are such that adequate fish passage is provided in terms of timing, frequency and duration, as well as water volume and depth. **And**	N/A	No waterway crossing is proposed.
	AO25.5 Water quality across the barrier allows for fish passage.	N/A	No waterway crossing is proposed.
Temporary waterway barrier works			
PO26 The temporary waterway barrier works will exist only for a temporary period and cause a minimal and	**AO26.1** Temporary waterway barrier works can be in place at a given site for no more than 12 months. **And**	N/A	The works periods are planned for between up to 3 months. Temporary works will be required (such as erosion and sediment controls). These will be undertaken in accordance

Performance outcomes	Acceptable outcomes	Response	Comment
acceptable disruption to fish movement in the area, during the period of installation. Editor's note: Code for self assessable development Temporary waterway barrier works (WWBW02), Department of Employment, Economic Development and Innovation, 2010 and the GIS data layer 'Queensland Waterways for Waterway Barrier Works' provide guidance on the length of time that a temporary barrier may be acceptable in particular streams.			with the DAF Code for self-assessable development: Temporary waterway barrier works (WWBW02)
	AO26.2 In tidal waters, to ensure significant impacts on upstream and downstream habitats are avoided, the temporary waterway barrier works will not completely block the waterway for more than three weeks, unless steps taken to ensure water exchange occurs (such as breaching of the bund or pumping water), to prevent upstream marine plants and benthos being submerged in freshwater, or the barrier is sufficiently permeable. **And**	N/A	As per AO26.1.
	AO26.3 Delays to fish movement are avoided at times when fish are known to be undertaking upstream spawning migrations, even on very small or zero flow events or river rises. Waterway barrier works are scheduled out of this period, or other provision for fish movement is made (for example, the use of a partial barrier, periodic barrier, stream diversion or fish way). **And**	N/A	As per AO26.1.
	AO26.4 Where there are species at the site that require downstream movement during works, provisions are made to allow those species to move downstream. **And**	N/A	As per AO26.1.
	AO26.5 Water diversion around the site or through the barrier is implemented if the barrier is in position for more than four weeks, and there is any flow in the system for the purpose of ensuring that vegetation die-off, decomposition and associated reduction in water quality does not become an issue upstream of the barrier, in areas where there is more than 30 per cent coverage of terrestrial grasses within the ponded area. **And**	N/A	As per AO26.1.
	AO26.6 Where there are aquatic macrophytes immediately downstream of the barrier and those macrophytes would ordinarily be submerged or partially submerged, water will need to be passed across the barrier at all times to avoid their desiccation. **And**	N/A	As per AO26.1.

Performance outcomes	Acceptable outcomes	Response	Comment
	AO26.7 On removal of a temporary barrier, full movement for fish is reinstated. **And**	N/A	As per AO26.1.
	AO26.8 On removal of a temporary barrier, the waterway bed and banks are returned to their original profile and stability, so that long-term fish movement at the site is not compromised.	N/A	As per AO26.1.
PO27 Fish movement is required past temporary waterway barrier works where the duration of the barrier is greater than that allowed for under the code for self assessable development Temporary waterway barrier works (WWBW02), Department of Agriculture, Fisheries and Forestry, April 2013. Editor's note: Code for self assessable development Temporary waterway barrier works (WWBW02), Department of Agriculture, Fisheries and Forestry, April 2013 and the GIS data layer 'Queensland waterways for waterway barrier works' provide guidance on the acceptable length of time that a temporary barrier may remain in place in particular streams.	**AO27.1** Development provides for adequate fish movement through the incorporation of a fish way or fish ways for the works. **And**	N/A	As per AO26.1.
	AO27.2 The barrier: (1) is a partial barrier (2) does not constrict the area or flows of a low flow channel (3) all work will be completed (and the barrier removed) during low flows when the flow will be contained wholly within a low flow channel. This would require a predictable flow regime where the likelihood of flow events during the works is very small (for example a 1 in 20 year probability). **And**	N/A	As per AO26.1.
	AO27.3 The barrier is opened periodically every five days for at least 48 hours to allow fish movement and water exchange. **And**	N/A	As per AO26.1.
	AO27.4 Fish movement is provided for via a stream diversion.	N/A	As per AO26.1.
PO28 Erosion control elements of the temporary waterway barrier works do not impact on fish passage.	**AO28.1** The use of gabions is avoided to prevent fish entrapment on receding flows.	N/A	As per AO26.1.
PO29 Fish passage is not necessary or desirable, for the best management, use, development or protection of fisheries resources or fish habitats, for the temporary waterway barrier works to	**AO29.1** It is demonstrated through an appropriate level of scientifically designed and executed fish survey by a suitably qualified and experienced entity that there are no fish in the area during any flow regimes. **And**	N/A	As per AO26.1.

Performance outcomes	Acceptable outcomes	Response	Comment
provide for the movement of fish across the barrier works. Editor's note: 'Other barriers' referred to in the Fisheries Act 1994 may be applied to existing natural barriers that preclude upstream fish movement. Provision of upstream fish movement at barrier works on the site of a waterfall that does not drownout is not necessary, providing that the works do not impact on climbing fish species (for example, with the installation of smooth surfaces or overhangs).	**AO29.2** The conditions at the site causing fish to be absent are not able to be remediated while the proposed barrier is in place. **Or**	N/A	As per AO26.1.
	AO29.3 There are other barriers in the area where the waterway barrier works is, or is to be, located which prevent movement of fish located in the area. **And**	N/A	As per AO26.1.
	AO29.4 Other barriers in the area of the waterway barrier works could not reasonably be expected to be modified or removed in the future to restore fish passage. **And**	N/A	As per AO26.1.
	AO29.5 Fish passage is not provided where this would introduce fish (including non-endemic fish or noxious fish) into an area where these species were not previously found, and this would be more detrimental to the existing fish community than the effect of the barrier.	N/A	As per AO26.1.
Construction			
PO30 The construction of waterway barrier works does not limit the movement or wellbeing of fish.	**AO30.1** Work does not commence during times of elevated flows. **And**	☑	The works are proposed to be undertaken prior to the wet season 2017/2018, where possible works will not be undertaken during times of elevated flow. Contractor is to comply with the EMP for duration of works.
	AO30.2 Excavation work in unbunded tidal areas is to be scheduled to occur within two hours either side of low tide. **And**	P/S	The rivers are only marginally influence by tidal flows, therefore tidal constraints are not proposed to be implemented.
	AO30.3 In-stream work is scheduled for the driest time of the year. **And**	☑	Works to occur prior to the 2017/2018 wet season and will extend over a period of 3 to 6 weeks.
	AO30.4 In-stream construction is completed as quickly as possible to lessen the impact on fish and habitats, and timed to minimise conflict with fish migrations. **And**	☑	Functional fish groups observed (and known to occur) within this reach include eels, grunters, gobies/gudgeons, barramundi. Data on these groups (Pusey *et al* 1995, Pusey and Kennard 1994, Bishop *et al* 2001) indicates that these groups have a very wide range of flow habitats, with migration occurring outside of low flow periods (i.e. lead up to the wet season). Construction will extend between 3 to 6 weeks and will occur during dry season flows when the majority of the fish groups do not migrate.

Performance outcomes	Acceptable outcomes	Response	Comment
	AO30.5 Routes for the developments are planned to minimise the impact on fish passage and fish habitat (for example, roads and railways minimise crossings and avoid crossings in environmentally sensitive areas).	☑	Vehicle access to the works site is via Junction Road Reserve to the MWTP. No other road access to the riverbank works sites is proposed. Works are to be conducted according to the Contractor EMP.
PO31 The development does not cause, or minimises direct or indirect disturbance to the bed and banks adjacent to the approved footprint of works.	**AO31.1** Removal of stream-bank vegetation and disturbance to the natural banks and bed of the waterway is avoided or minimised. **And**	☑	Removal of steam bank vegetation and disturbance to the natural bed of the waterway has been minimised to largest practical extent, taking into consideration the design parameters of the revetment walls to protect the MWTP infrastructure. Refer to appended drawings.
	AO31.2 Disturbance to the outer bank of waterway beds during work and while gaining access is minimised. **And**	☑	Access to the banks of the waterway will be via: a) access through the Mossman WWTP which is on the high point of the bank (for both the Mossman and South Mossman Rivers), and b) a floating work platform at the base of the bank will be installed on the South Mossman River. This will be accessed from an existing road (Cooya Beach Road) which crosses and is adjacent to the works area. No vegetation removal is required for access, with both sites being cleared.
	AO31.3 Heavy machinery is excluded from fragile areas and areas which host fisheries resources. **And**	☑	Heavy machinery will be restricted to the work platforms either on the South Mossman River (on a floating platform) or work from the top of the bank in cleared areas. No operation of heavy machinery within the bed of the rivers is proposed.
	AO31.4 After completion of the in-stream works, all areas of the bed and banks of the waterway that are outside of the approved permanent footprint of the works, and which have been disturbed as a result of the construction or raising of the waterway barrier works, are returned to their original profile and stabilised to promote regeneration of natural fish habitats. **And**	☑	A qualified botanist has assessed the vegetation to be removed and a revegetation program will be implemented at the end of construction that will aim to reinstate native vegetation to the surrounding areas that have been impacted. The Contractor is to comply with the EMP for waste management and leave the site in a clean and tidy state.
	AO31.5 By the completion of works, the profiles of the bed and banks are reinstated to natural stream profiles and stability. **And**	☑	No disturbance of the profiles of the bed and bank, other than the work areas for revetment walls, will be undertaken. A floating works platform will be used on the South Mossman River and a long arm excavator will be used from the top of the bank (within the MWTP) to access the banks of the Mossman River and top sections of the bank of the South Mossman River. Subsequently there is no requirement for machinery to access the bed of the rivers.

Performance outcomes	Acceptable outcomes	Response	Comment
			Material excavated from the river beds for the revetment wall toe will be returned to the river beds in a manner that retains the natural bed profile.
	AO31.6 The waterway bed will be retained with natural substrate, or reconstructed with substrate comparable to the natural substrate size and consistency. **And**	N/A	The existing natural substrate will remain. There are no proposals to replace or reconstruct the waterway bed. Excavation only is proposed for the toe of the revetment structures within the waterway bed. The revetment structures will consist of rockfill over geotextile fabric. Refer to appended drawings.
	AO31.7 Vegetation and cover will be rapidly re-established so that the native plant community at the site can recover or be enhanced (for example, by using native species). **And**	☑	Douglas Shire Council's own Revegetation Unit will be responsible for the implementation of the revegetation program. The program will begin immediately on cessation of construction works.
	AO31.8 Fish habitats, including fisheries resource values, will be able to naturally regenerate to pre-works conditions. Editor's note: Monitoring of the success of fish habitat regeneration, within and adjacent to the work site, will be a development permit condition.	PS	As the revetment walls are intended to be permanent structures it is not expected that these areas of modified bank will regenerate to pre-works conditions. However the rockfill revetment walls will provide habitat resources that currently are not present at either works locations.
Additional requirements for development within a strategic environmental area			
PO32 Sediment and other polluting material must be captured during construction and operation of a waterway barrier.	**AO32.1** During construction: (1) environmental safety measures such as silt curtains are used to capture sediments, (2) materials that are pollutants (such as debris, chemicals, or construction material) are not stored in the stream bed, unless they are to be used immediately. **And**	N/A	Project sites are not within a strategic environmental area.
	AO32.2 After construction the stream bed and banks are protected to prevent erosion or slumping, by ensuring: (1) the waterway bed is lined with the original top soil retained during the construction (2) materials that are pollutants (such as debris, chemicals, or construction material) are removed from the location and appropriately treated and disposed of as waste outside the strategic environmental area – for example to a managed landfill	N/A	Project sites are not within a strategic environmental area.

Performance outcomes	Acceptable outcomes	Response	Comment
	(3) temporary barriers are removed after use and the natural materials either returned to their original location in the strategic environmental area, or if not taken from the strategic environmental area, appropriately treated and disposed of as waste outside the strategic environmental area – for example to a managed landfill.		
PO33 The works do not impede fish passage particularly during critical periods that are important for breeding, feeding, nursery and recruitment of indigenous fish species.	**AO33.1** Works (except temporary works required for less than 20 business days) that are not drowned out regularly must contain a fish way, the design of which is approved by the Department of Agriculture and Fisheries. **And**	N/A	Project sites are not within a strategic environmental area.
	AO33.2 Any fish way must be operational at all times except where natural flows would have prevented fish passage. **And**	N/A	Project sites are not within a strategic environmental area.
	AO33.3 In the case of drought, any fish trapped in the impoundment must be rescued. **And**	N/A	Project sites are not within a strategic environmental area.
	AO33.4 Vegetation and cover is retained or replaced to pre-work levels and conditions. **And**	N/A	Project sites are not within a strategic environmental area.
	AO33.5 All works are constructed during periods when fish passage is least affected.	N/A	Project sites are not within a strategic environmental area.
PO34 Development avoids or minimises any adverse impacts on environmental values and water quality objectives for receiving waters (surface and groundwater) on site or leaving a site from pollutants.	**AO34.1** Development demonstrates best practice environmental management to meet relevant environmental values and water quality objectives of the Environmental Protection (Water) Policy. **Or**	N/A	Project sites are not within a strategic environmental area.
	AO34.2 All stormwater, wastewater, discharges and overflows leaving the site are: (1) treated to the quality of the receiving waters prior to discharge, or (2) reclaimed or re-used such that there is no export of pollutants to receiving waters.	N/A	Project sites are not within a strategic environmental area.

10.1 Tidal works, or development in the coastal management district state code

Response column key:
- ☑ Achieved
- **P/S** Performance solution
- **N/A** Not applicable

Table 10.1.1: All development

Performance outcomes	Acceptable outcomes	Response	Comment
PO1 Development in a coastal hazard area is compatible with the level of severity of the coastal hazard.	**AO1.1** Development is located outside a high coastal hazard area unless it is: (1) coastal-dependent development, or (2) compatible with inundation due to its nature or function, or (3) temporary, readily relocatable, or able to be abandoned, or (4) essential community service infrastructure, or (5) small- to-medium scale tourist development, or (6) redevelopment within an existing built-up urban area, or is redevelopment of built structures that cannot be relocated or abandoned. **And**	☑	EHP mapping identifies that the works are located within a coastal hazard area for high storm tide inundation, medium storm tide inundation and erosion prone area. These works are considered essential community service infrastructure. There is a high risk that ongoing erosion of the existing bank will occur that poses risks to Mossman Wastewater Treatment Plant (MWTP) infrastructure, (a DSC local government asset) should the remediation works not occur. Banks eroding on both the Mossman River and South Mossman Rivers have close to a vertical drop on both sides with slopes 60-80 degrees from horizontal. Erosion is continuing at both sites.
	AO1.2 Development referred to in AO1.1(6) avoids being located within a high coastal hazard area, or where this is not practicable, minimises the exposure of people and permanent structures to coastal hazard impacts.	P/S	The works are designed in accordance with relevant engineering standards that include calculations associated with the hydraulics of Mossman and South Mossman Rivers. The design aims to withstand hazard categories identified for this location and to minimise the potential of impacts to the banks and coastal zone. The works aim to remediate the eroding banks and provide protection from further erosion to public infrastructure.
PO2 Development siting, layout and access in a coastal hazard area responds to potential inundation due to a defined storm tide event and minimises associated risks to personal safety and property.	**AO2.1** Development within a coastal hazard area is located, designed, constructed and operated to maintain or enhance the community's resilience to a defined storm tide event by limiting the exposure of people and structures to associated impacts. **And**	☑	The proposed revetments are on the banks of the Mossman and South Mossman Rivers and have been designed to match the adjacent bank profiles where practical by an appropriately (RPEQ) qualified engineer. Benching of the bank is proposed in accordance with engineering standards to secure the armour rock that will be installed to withstand flows of up to 3 m/second. Rockfill is to be employed as toe stabilisation to increase the restoring moment in circular slip failure analyses. Treatment involves cutback 1.5V:1.5H plus rockfill blanket with berm.
	AO2.2 Development mitigates any residual impacts from storm tide inundation in a coastal hazard area including by ensuring:	☑	The proposed revetment does not pose a risk to people in relation to storm surge events as formal access for the community has not been, and is not intended to be, provided

Performance outcomes	Acceptable outcomes	Response	Comment
	(1) habitable rooms of built structures are located above the defined storm tide event level and any additional freeboard level that would ordinarily apply in a flood prone area under a relevant planning scheme standard, or (2) a safe refuge is available for people within the premises during a defined storm tide event, or (3) at least one evacuation route remains passable for emergency evacuations during a defined storm tide event, including consideration of the capacity of the route to support the evacuation of the entire local population within a reasonably short timeframe (for example, 12 hours). **And**		at this location. MWTP employees would evacuate the site in the event of storm tide inundation. The main employee and visitor only access point is the access driveway from Junction Rd to MWTP, approximately 150 m upstream and to the south of the MWTP infrastructure. There is a risk should protective measures not be put in place prior to the 2017/2018 Wet Season, that further erosion will encroach into the Junction road reserve and Mossman and South Mossman River esplanade reserves causing potential damage to MWTP infrastructure and posing risks of infrastructure sliding into the South Mossman River (in particular).
	AO2.3 Development within a coastal hazard area is located, designed and constructed to ensure exposed structures can sustain flooding from a defined storm tide event. **And**	☑	The works are RPEQ approved designs in accordance with relevant engineering standards that include calculations associated with the hydraulics of the Mossman and South Mossman Rivers. Refer to appended drawings. The design aims to withstand the hazard categories for this location and minimise the potential of impacts to the coast. Refer to appended drawings.
	AO2.4 Essential community service infrastructure is: (1) located so that it is not inundated by a recommended storm tide event specified for that infrastructure, or (2) located and designed to ensure any components of the infrastructure that are likely to fail to function or may result in contamination when inundated by a storm tide (for example, electrical switch gear and motors, water supply pipeline air valves) are: (a) located above the peak water level for a recommended storm tide event, or (b) designed and constructed to exclude storm tide intrusions or infiltration (including by being located in the ground), or (c) able to temporarily stop functioning during a recommended storm tide event without causing significant adverse impacts to the infrastructure or the community. **And**	P/S	The remediation works are required as a result of ongoing bank scouring and are required to protect essential community infrastructure from ongoing scouring and storm tide events. There is a risk that further erosion will occur that will impact MWTP infrastructure causing it to fail or breach the existing oxidation ditch, clarifier or sludge lagoons located on a road reserve immediately adjacent to the riverbank areas. The oxidation ditch is only 8 metres from the inlet to the South Mossman River Bank and 10 metres at the highest point. The clarifier is only 9 metres to the river bank and the RAS well is only 8 metres to the river bank. A sludge lagoon is located only 10 m from the crest of the slope and an outfall pipeline is approximately 35 m south.

Performance outcomes	Acceptable outcomes	Response	Comment
	AO2.5 Emergency services infrastructure and emergency shelters, police facilities, and hospitals and associated facilities have an emergency rescue area above the peak water level for a recommended storm tide event.	N/A	N/A
PO3 Development directly, indirectly and cumulatively avoids an unacceptable increase in the severity of the coastal hazard, and does not significantly increase the potential for damage on the premises or to other premises.	**AO3.1** Development avoids increasing the number of premises from which people would need to be evacuated to prevent death or injury from a defined storm tide event.	☑	The developed is the stabilising of banks adjacent to the existing MWTP infrastructure on narrow road reserve and river bank esplanades. The development avoids an unacceptable increase in the severity of coastal hazards and does not increase the potential for damage on the premises or to other premises.
PO4 Development avoids the release of hazardous materials as a result of a natural hazard event. Editor's note: Applications should: (1) assess the risk of storm tide inundation releasing or otherwise exposing hazardous materials, including appropriate emergency planning and contingency measures. (2) applications are to be supported by a report certified by a Registered Professional Engineer of Queensland (RPEQ) that demonstrates this performance outcome will be achieved.	**AO4.1** Development that involves the manufacture or storage of hazardous materials in bulk are designed to: (1) prevent the intrusion of waters from a defined storm tide event into structures or facilities containing the hazardous materials, or (2) ensure hazardous materials remain secured despite inundation, including secure from the effects of hydrodynamic forcing associated with wave action or flowing water.	P/S	Bank stabilisation is essential to prevent a possible breach from the oxidation ditch, clarifier or sludge lagoons 1 or 2 at MWTP of partially treated sewage and wastewater. RPEQ certified design has been developed. The Contractor is to comply with an Environmental Management Plan (EMP) incorporating safe handling and storage of hazardous materials for revetment works.
PO5 Natural processes and the protective function of landforms and vegetation are maintained in coastal hazard areas.	**AO5.1** Development in an erosion prone area within the coastal management district: (1) maintains vegetation on coastal landforms where its removal or damage may: (a) destabilise the area and increase the potential for erosion, or (b) interrupt natural sediment trapping processes or dune or land building processes (2) maintains sediment volumes of dunes and near-shore coastal landforms, or where a reduction in sediment volumes cannot be avoided, increased risks to development from coastal erosion are mitigated by location, design, construction and operating standards	P/S	Vegetation clearing will be required and limited to the project area. The vegetation is not coastal in nature, but is reef-regrowth vegetation. There are no dunes at this location. The bank contains natural in-situ soils, sands, silts and clay based on borehole data and available mapping. The project is to occur on the bank of the Mossman and South Mossman Rivers. This work will provide batter protection to the banks from flows of up to 3m/ seconds generated during future wet seasons. The rock work will be restricted to the designed footprint and not extend into adjacent vegetated banks with the exception of tying the edges into the existing landform, as shown in the design drawings. It is proposed that the works will match the batter profiles that exist either side of the footprints.

Performance outcomes	Acceptable outcomes	Response	Comment
	(3) minimises the need for erosion control structures or riverbank hardening through location, design and construction standards (4) maintains physical coastal processes outside the development footprint for the development, including longshore transport of sediment along the coast (5) reduces the risk of shoreline erosion for areas adjacent to the development footprint unless the development is an erosion control structure (6) reduces the risk of shoreline erosion for areas adjacent to the development footprint to the maximum extent feasible in the case of erosion control structures. **And**		A construction EMP will be implemented by the Contractor to address critical Environmental Management elements; such as erosion and sediment control, stormwater management, water quality, noise and air quality, ecology and weed management, waste management, cultural heritage, wildlife and vegetation associated with the construction works. These works aim to minimise the risk of further erosion of the bank and provide protection to vegetation in adjacent areas.
	AO5.2 Development in a storm tide inundation area is located, designed, constructed and operated to: (1) maintain dune crest heights, or where a reduction in crest heights cannot be avoided, mitigate risks to development from wave overtopping and storm tide inundation (2) maintain or enhance coastal ecosystems and natural features, such as mangroves and coastal wetlands, between the development and tidal waters, where the coastal ecosystems and natural features protect or buffer communities and infrastructure from sea-level rise and impacts from storm tide inundation. **And**	N/A	Development is not on the shoreline nor located on coastal wetlands. However it is located within a high storm tide inundation area and erosion prone area. Contractor is to adhere to an EMP.
	AO5.3 Redevelopment of built structures in the erosion prone area within a coastal management district: (1) avoids intensifying the use of the premises, or (2) demonstrates that any intensification of use will not result in an increase in the need for erosion control structures or riverbank hardening. **And**	☑	There will be no intensity to the scale of development that was here previously. This revetment walls will provide protection to the bank from the up to 3 m / second flows generated in the Mossman and South Mossman Rivers. Existing riverbank slips are worsening. Hence the need for erosion control via bank revetment works.
	AO5.4 Development that is coastal protection work involves, in order of priority: (1) beach nourishment undertaken in accordance with a program of beach nourishment works that source	☑	The erosion control proposed is required to protect the bank and is required to be constructed prior to the 2017/2018 Wet Season to protect the existing MWTP infrastructure.

Performance outcomes	Acceptable outcomes	Response	Comment
	sediment of a suitable quality and type from outside the active beach system, or (2) the construction of an erosion control structure, where it is demonstrated that installing an erosion control structure is the only feasible option for protecting permanent structures from coastal erosion and those structures cannot be abandoned or relocated in the event of coastal erosion occurring. Editor's note: Applications for coastal protection work should be supported by a report certified by a Registered Professional Engineer of Queensland (RPEQ) that demonstrates how the engineering solution sought by the work will be achieved. Editor's note: Applications for erosion control structures should demonstrate the consideration of beach nourishment techniques, and include a statement of why nourishment (in whole or part) has not been adopted as the preferred means of controlling the erosion risk. **And**		The protection has been designed to match the profile of the adjacent Mossman and South Mossman Riverbanks.
	AO5.5 Development involving reclamation: (1) does not alter, or otherwise minimises impacts on, the physical characteristics of a waterway or the seabed near the reclamation, including flow regimes, hydrodynamic forces, tidal water and riverbank stability (2) is located outside the active sediment transport area, or otherwise maintains sediment transport processes as close as possible to their natural state (3) ensures activities associated with the operation of the development maintain the structure and condition of vegetation communities and avoid wind and water run-off erosion. Editor's note: Applications for reclamation should be supported by a report certified by an RPEQ that demonstrates how the engineering solutions sought by the work will be achieved	N/A	There is no reclamation proposed.
PO6 Erosion prone areas in a coastal management district are maintained as development free buffers, or where permanent buildings or structures exist, coastal erosion risks are avoided or mitigated.	**AO6.1** Development locates built structures outside the part of the coastal management district that is the erosion prone area unless the development is listed under AO1.1 (1) – (4). **And**	☑	The stabilisation works is within the erosion prone area and the built structure proposed is to protect the bank from further ongoing erosion. This is to preserve the current bank alignment as well as protecting local MWTP infrastructure that is at risk from bank recession. The engineering works are proposed to be undertaken prior to the 2017/2018 Wet Season.

Performance outcomes	Acceptable outcomes	Response	Comment
	AO6.2 Small to medium scale tourist development is located outside the erosion prone area unless it is redevelopment. **And**	N/A	The development is not tourist related.
	AO6.3 Coastal-dependent development: (1) locates, designs and constructs relevant buildings or structures to withstand coastal erosion impacts, including by use of appropriate foundations, or (2) installs and maintains coastal protection works to mitigate adverse impacts to people and permanent structures from coastal erosion at the location. **And**	☑	The works are a coastal protection measure to protect Mossman and Mossman South Riverbank esplanades from further scouring and encroachment within the existing MWTP site infrastructure.
	AO6.4 Development that is temporary, readily relocatable or able to be abandoned, or essential community service infrastructure: (1) locates built structures landward of an applicable coastal building line, or (2) where there is no coastal building line, locates habitable built structures landward of the alignment of adjacent habitable buildings, or (3) locates lifesaver towers or beach access infrastructure to minimise its impacts on physical coastal processes, or (4) where it is demonstrated that (1) or (2) is not reasonable and (3) does not apply: (a) locates built structures as far landward as practicable (b) uses layout design to minimise the footprint of the development that remains within the erosion prone area. **And**	☑	The works are a coastal protection measure to protect Mossman and Mossman South Riverbank esplanades from further scouring and encroachment within the existing MWTP site infrastructure.
	AO6.5 Redevelopment of existing built structures not referred to in AO6.4, and excluding marine development: (1) relocates built structures outside that part of the erosion prone area that is within the coastal management district, or	N/A	N/A

Performance outcomes	Acceptable outcomes	Response	Comment
	(2) relocates built structures as far landward as practicable, and landward of an applicable coastal building line, or (3) where there is no coastal building line: (a) relocates built structures landward of the alignment of adjacent habitable buildings, or (b) uses layout design to minimise the footprint of the development that remains within the erosion prone area, or (c) provides sufficient space seaward of the development within the premises to allow for the construction of erosion control structures. **And**		
	AO6.6 Redevelopment of built structures in the erosion prone area within a coastal management district, which results in an intensification of use, mitigates the erosion threat to the development, having regard to: (1) design and construction standards (2) installing and maintaining on-site erosion control structures within the premises if the development is not intended to be temporary.	N/A	N/A
PO7 Development avoids or minimises adverse impacts on coastal resources and their values, to the maximum extent reasonable.	**AO7.1** Coastal protection work that is in the form of beach nourishment uses methods of placement suitable for the location that do not interfere with the long-term use of the locality of, or natural values within or neighbouring, the proposed placement site. **And**	N/A	Site is located approximately 3.5 km upstream from the coastal fringe. Beach nourishment not proposed.
	AO7.2 Marine development is located and designed to expand on or redevelop existing marine infrastructure unless it is demonstrated that it is not practicable to co-locate the development with existing marine infrastructure. **And**	N/A	Site is located approximately 3.5 km upstream from the coastal fringe and is not a marine environment.
	AO7.3 Marine development: (1) relies on a natural channel of a depth adequate for the intended vessels, or (2) where there are no feasible alternative locations for the facility in the local area that do not require	N/A	Site is located approximately 3.5 km upstream from the coastal fringe and is not a marine environment.

Performance outcomes	Acceptable outcomes	Response	Comment
	dredging for navigation channel purposes, development is located, designed and operated to minimise the need for capital and maintenance dredging for navigation channel purposes. **And**		
	AO7.4 Development minimises dredging or the disposal of material in coastal waters during key biological events (such as fish aggregations or spawning) for species found in the area. **And**	N/A	N/A. No dredging is required and disposal of material in coastal waters will not be undertaken as part of this project.
	AO7.5 Measures are to be incorporated as part of siting and design of the development to protect and retain identified ecological values and underlying ecosystem processes within or adjacent to the development site to the greatest extent practicable. This includes: (1) maintaining or restoring vegetated buffers between development and coastal waters to the extent practicable, unless the development is within ports or airports, or is marine development (2) maintaining or enhancing the connectivity of ecosystems in consideration of the cumulative effect of the development in addition to existing developed areas (3) retaining coastal wetlands, seagrass beds and other locally important feeding, nesting or breeding sites for native wildlife. **And**	P/S	The existing ecological values of the immediate works footprint, i.e. riparian margins, will not be retained or re-established due to the nature of the revetment walls proposed. However, the opposite and upstream/downstream ecological values are not proposed to be disturbed, therefore it is considered that ecological ecosystem impacts will be minor and will continue to provide riparian margin connectivity. No coastal wetlands, seagrass beds or marine plants apply to this location.
	AO7.6 Measures are incorporated as part of siting and design of the development to maintain or enhance water quality to achieve the environmental values and water quality objectives outlined in the Environmental Protection (Water) Policy 2009. **And**	P/S	Impacts to water quality, arising from suspended solids, are expected during construction. These aspects are expected to be temporary for the construction period only, and will be managed through the implementation of an EMP that will include erosion and sediment control as a key element. The works will provide long term benefits as protection to the bank will reduce the loss of sediment and erosion to the Mossman and South Mossman River water bodies.
	AO7.7 Development avoids the disturbance of acid sulphate soils, or where it is demonstrated that this is not possible, the disturbance of acid sulphate soils is carefully	P/S	Geotechnical investigations by suitably qualified personnel (Golders, 2007) have identified a low potential for sulphate soils being present based on geotechnical investigations. The soils of the river bed and instream areas are primarily of

Performance outcomes	Acceptable outcomes	Response	Comment
	managed to minimise and mitigate the adverse effects of the disturbance on coastal resources.		unconsolidated active stream channel sediments with deep sandy profiles derived from transported material and do not support acid sulphate generating conditions. Soils of the upper banks on which the MWTP is situated are comprised of clay/loam/sandy soils derived from tenusols/rudosols and prone to erosion and do not present a significant acid sulphate generation risk when disturbed. The presence of acid sulphate soils will be carefully monitored during construction and the Contractor will be responsible for adhere to the EMP with respect to water quality, ASS and erosion and sediment control. Should high risk conditions be identified during construction, this represents a project hold point during which acid sulphate soil management plan will be prepared in accordance with the Queensland Acid Sulfate Soil Technical Manual.
PO8 Coastal protection work is undertaken only as a last resort where erosion presents an imminent threat to public safety or permanent structures. Editor's note: Applications for coastal protection work must be supported by a report certified by an RPEQ that demonstrates how the engineering solution sought by the work will be achieved.	**AO8.1** Coastal protection work is only undertaken to protect existing permanent structures from imminent adverse coastal erosion impacts, and the structures cannot reasonably be relocated or abandoned. **And**	☑	The works proposed are to protect the existing bank and DSC local government structures from the risk of further erosion during subsequent Wet Seasons.
	AO8.2 Coastal protection work to protect private structures is undertaken on private land to the maximum extent reasonable. **And**	N/A	Works are on state land were practical (road reserve and waterway/esplanade tenure). Minor work on freehold land is required to enable adequate tie in of the revetment walls.
	AO8.3 Coastal protection work does not increase the coastal hazard risk for adjacent areas or properties.	☑	The coastal hazard risk will not be increased, as the proposed works are designed to be consistent with the current batter and alignment of the banks of the Mossman and South Mossman Rivers. Works aim to stabilise the existing areas of erosion.
PO9 Development avoids adverse impacts on matters of state environmental significance, or where this is not reasonably possible, impacts are minimised and an environmental offset is provided for any significant residual impacts to matters of state environmental significance that are prescribed environmental matters.	**AO9.1** Development: (1) is set back from matters of state environmental significance (2) avoids interrupting, interfering or otherwise adversely impacting underlying natural ecosystem components or processes and interactions that affect or maintain the matters of state environmental significance, such as water quality, hydrology, geomorphology and biological processes, or	☑	The MSES state database report (attached) has identified the following MSES at the works area: **Criteria 1: State Conservation Areas** **1.1 Protected Areas**. No protected areas are within or adjacent (within 2 km) to the works area. No protected area will be affected by the works. **1.2 Marine Parks**. No marine parks are present or adjacent of the works area. The marine park (general use zone) is located 4.3 km downstream of the work areas on the river banks. Key mitigation measures to

Performance outcomes	Acceptable outcomes	Response	Comment
	(3) incorporates measures as part of its location and design to protect and retain matters of state environmental significance and underlying ecosystem processes within and adjacent to the development site to the greatest extent practicable. Editor's note: Applications for development should identify any threatened species or their habitats, or threatened ecosystems that may be affected by the proposal. In particular, applications should identify and describe how the development avoids adverse impacts on any critical life stage ecological processes within or adjacent to the development area.		minimise risk of indirect impacts include undertaking bank stabilisation works during the dry season when river flows are low, and the installation of instream silt curtains during construction to minimise the risk of transported sediments. **1.3 Fish Habitat Areas**. No fish habitat areas are mapped within or adjacent to the proposed work areas. **Criteria 2 – Wetlands and Waterways** **2.1 HES wetlands on Referable Wetlands Map.** There are no High Ecological Significant wetlands present adjacent to or within the project area. **2.2 HEV wetlands.** There are no High Ecological Value wetlands present adjacent to or within the project area. **2.3 Strategic Environmental Areas.** There are no strategic environmental areas present adjacent to or within the project area. **Criteria 3 – Species** **3.1 Threatened Species and Iconic species.** The works area and buffer area was surveyed for protected flora species in accordance with the provisions of the *Nature Conservation Act 1992* (NC Act) *Flora Survey Guidelines – Protected Plants* by an EHP accredited botanist. No protected flora species were identified and subsequently an application for an exemption for protected plant clearing permit has been prepared and will be lodged to EHP/PALM independent of this application. A Wildlife Online database search identified a number of special least concern fauna (32 of which 31 are migratory species), 2 endangered fauna species, 3 vulnerable species occurring within a 5 km radius of the project site. This search radius included Mossman Gorge and the Daintree National Park that is located 3 km west wherein most of the records were obtained. Ecological surveys (both terrestrial and aquatic) of the project works area were undertaken by a suitably qualified ecologist for this project. The project area has been heavily modified through previous clearing, introduction of exotic species, prior occupation and earth slips. No threatened or iconic species were located within the project area and it considered that

Performance outcomes	Acceptable outcomes	Response	Comment
			that owing to the condition of the habitat available that any visitation would opportunistic and transient. **Criteria 4 Regulated Vegetation – area features:** The surrounding area includes previous clearing for agricultural purposes with riparian margins of waterways generally intact. However the project will impact on a total of 4,050 m^2 vegetation mapped as Category R reef regrowth watercourse vegetation under Regulated Vegetation Mapping. **Criteria 4 Regulated Vegetation – linear features:** **4.1 Vegetation Management Regional Ecosystems and Remnant Map:** The vegetation to be removed comprises 44,050 m^2 vegetation mapped as Category R reef regrowth watercourse vegetation under Regulated Vegetation Mapping. **4.2 Vegetation Management Wetland Map:** There is no mapped wetland vegetation within or adjacent the project area. **4.3 Vegetation Management Watercourse Map**: Over 14 km of regulated vegetation is mapped along watercourses within 2 km radius of the project area. The project will require clearing of 2,230 m^2 of mapped regulated Category R Reef regrowth watercourse vegetation on the South Mossman River and 1,820 m^2 of mapped regulated Category R Reef regrowth watercourse vegetation on the Mossman River. **Criteria 5 – Offset Areas** **5.2 Legally secured offset areas:** There are no legally secure offset areas within or adjacent the project area. **TOTAL MSES: 4,050 m^2 vegetation mapped as Category R Reef regrowth watercourse vegetation.**
	AO9.2 Where impacts cannot be reasonably avoided or minimised, an environmental offset is provided for any significant residual impact on matters of state environmental significance that are prescribed environmental matters caused by the development. Editor's note: Applications for development should identify anticipated losses, and outline what actions are proposed to be undertaken to offset the loss in accordance with the Significant	N/A	Environmental offsets are not required for these works as a significant residual impact is not anticipated.

Performance outcomes	Acceptable outcomes	Response	Comment
	Residual Impact Guideline and the relevant Queensland Environmental Offsets Policy.		
PO10 Development maintains or enhances general public access to or along the foreshore, unless this is contrary to the protection of coastal resources or public safety.	**AO10.1** Development adjacent to state coastal land or tidal water: (1) demonstrates that restrictions to public access are necessary for: (a) the safe or secure operation of development, or (b) the maintenance of coastal landforms and coastal habitat (2) separates residential, tourist and retail development from tidal water with public areas or public access facilities, or (3) maintains existing public access (including public access infrastructure that is in the public interest) through the site to the foreshore for: (a) pedestrians, via access points including approved walking tracks, boardwalks and viewing platforms, or (b) vehicles, via access points including approved roads or tracks. **And**	☑	Development is within the Coastal Management District. The proposed works are to provide protection to DSC local government MWTP infrastructure. Access is enabled for MWTP employees and visitors only. Access to MWTP is via the Junction Road Reserve site driveway, located approximately 150m to the south of the proposed works. Public access is not available to these sites. The revetment walls are not expected to alter any of the current uses (and access) of either river system.
	AO10.2 Development adjacent to state coastal land, including land under tidal water: (1) is located and designed to: (a) allow safe and unimpeded access to, over, under or around built structures located on, over or along the foreshore (b) ensure emergency vehicles can access the area near the development, or (2) minimises and offsets any loss of access to and along the foreshore within two kilometres of the existing access points, and the access is located and designed to be consistent with (1)(a) and (b). **And**	☑	Access is enabled for MWTP employees and visitors only. Emergency vehicle access is via the Junction Road Reserve site access to MWTP located approximately 150 m to the south of the proposed works. The Project is not located along a foreshore but the Mossman and South Mossman Rivers. The revetment walls are not expected to alter any of the current uses (and access) of either river system.
	AO10.3 Any parts of private development that extend over tidal water are to be designed, constructed and used for marine access purposes only.	N/A	N/A. Not private development.

Performance outcomes	Acceptable outcomes	Response	Comment
PO11 Private marine development avoids structures attaching to, or extending across, non-tidal state coastal land abutting tidal waters.	**AO11.1** Private marine development and other structures such as decks or boardwalks for private use do not attach to, or extend across state coastal land that is situated above the high water mark. Editor's note: For occupation permits or allocations of State land, refer to the *Land Act 1994.*	N/A	N/A
PO12 Further development of artificial waterways avoids or minimises adverse impacts on coastal resources and their values, and does not contribute to: (1) an increase in the risk of flooding or erosion (2) degradation of water quality (3) degradation and loss of matters of state environmental significance (including, but not limited to, coastal wetlands, fish habitat areas and migratory species habitat).	**AO12.1** The design, construction and operation of artificial tidal waterways maintains the tidal prism volume of the natural waterway to which it is connected. **And**	N/A	N/A. No artificial waterways apply.
	AO12.2 The design, construction and operation of artificial tidal waterways does not increase risk from flooding. **And**	N/A	N/A
	AO12.3 The design, construction and operation of an artificial waterway in connection with the reconfiguration of a lot ensures: (1) water inlet and outlets structures are of sufficient capacity to maintain the water quality within the waterway (2) water discharged from the artificial waterway protects the environmental values and water quality objectives of the receiving waters (3) dredged material is not disposed of in tidal water beyond the artificial waterway unless there is a beneficial reuse, e.g. beach nourishment. Editor's note: For more information on environmental values and water quality objectives see schedule 1 of the Environment Protection (Water) Policy 2009. **And**	N/A	N/A
	AO12.4 The location of the artificial waterways avoids matters of state environmental significance, or does not result in any significant adverse impact on matters of state environmental significance.	N/A	N/A
PO13 Development does not involve reclamation of land below tidal water, other than for the purposes of:	No acceptable outcome is prescribed.	N/A	N/A. No reclamation of land applies.

Performance outcomes	Acceptable outcomes	Response	Comment
(1) coastal-dependent development, public marine development or community infrastructure (2) strategic ports, boat harbours or strategic airports and aviation facilities, in accordance with a statutory land use plan, where there is a demonstrated net benefit for the state or region and no feasible alternative exists (3) coastal protection work or work necessary to protect coastal resources or physical coastal processes.			

Table 10.1.2: Operational work

Performance outcomes	Acceptable outcomes	Response	Comment
PO1 Tidal works that is private marine development does not result in adverse impacts to tidal land. Editor's note: In addressing this performance outcome, the applicant should comply with the performance criteria and acceptable standards set out in the Operational Policy Building and engineering standards for tidal works, Department of Environment and Heritage Protection, 2013. Editor's note: Applications should be supported by a report certified by an RPEQ to demonstrate compliance with this performance outcome.	**AO1.1** The location and design of tidal works that is private marine development: (1) is on private land abutting tidal water and used for property access purposes (2) occupies the minimum area reasonably required for its designed purpose (3) is not to be roofed or otherwise covered (4) does not require the construction of coastal protection works, shoreline or riverbank hardening or dredging for marine access (5) does not adversely impact on public safety or public access and use of the foreshore.	N/A	N/A. No private marine development applies.
PO2 Development does not result in the disposal of material dredged from an artificial waterway into coastal waters, with the exception of: (1) reclamation works, or (2) coastal protection works, or (3) the maintenance of an existing artificial waterway and the at-sea disposal of material that has	**AO2.1** The design and construction of the artificial waterway includes onsite provisions for drying, re-handling and disposal of dredge material on site to facilitate the timely disposal to land or re-use.	N/A	N/A. No dredge spoil will be produced as part of this revetment project.

Performance outcomes	Acceptable outcomes	Response	Comment
previously been approved for the waterway.			
PO3 The design and construction of an artificial waterway maintains coastal landforms.	**AO3.1** The design and construction of the artificial waterway provides for sand bypassing where this is necessary to prevent erosion of adjacent coasts and minimise sedimentation of the waterway. **And**	N/A	N/A. No construction of an artificial waterway.
	AO3.2 Clean sand accumulating within an artificial waterway is returned to the active beach system, in preference to disposal on land.	N/A	N/A
PO4 Development that involves dredging includes and complies with a management plan that demonstrates how environmental impacts will be managed and mitigated, and how the requirements of the National assessment guidelines for dredging, Australian Government Department of the Environment, Water, Heritage and the Arts, 2009, will be met.	**AO4.1** A management plan for the development: (1) directs the operation of the development (2) identifies disposal methods and disposal sites for the removed material for the construction and operational phases of the development (3) outlines how any adverse effects from extraction activities on sediment transport processes or adjacent coastal landforms will be mitigated or otherwise remediated by suitably planned and implemented beach nourishment and rehabilitation works. Editor's note: The suitability of the dredged sediment for ocean disposal is to follow the assessment of potential contaminants under the National assessment guidelines for dredging, Australian Government Department of the Environment, Water, Heritage and the Arts, 2009. **And**	N/A	N/A. No dredging is required.
	AO4.2 For land based disposal of dredged material, any area used for storing, dewatering, drying or rehandling dredged material as outlined in the dredge management plan is: (1) of sufficient size for the projected volume of dredged material from relevant capital or maintenance dredging (2) protected from future development that would compromise the use of the area for its intended purpose of material storage and dewatering. **And**	N/A	N/A

Performance outcomes	Acceptable outcomes	Response	Comment
	AO4.3 For at-sea disposal of suitable dredged material, the dredge management plan specifies that material is placed at a dredged material disposal site only if it is demonstrated that it is not feasible to: (1) dispose of the material above the high water mark, if the material is from maintenance works for an existing artificial waterway for which at-sea disposal was previously approved, or (2) keep the dredged material within the active sediment transport system for the locality, or (3) use the material for beach nourishment or another beneficial purpose. **And**	N/A	N/A
	AO4.4 For at-sea disposal of dredged material where the marine spoil disposal site is a retentive (i.e. non-dispersive) site, the disposal site identified in the dredge management plan has the capacity to hold and retain the material within its boundaries during construction and operation of the development. Editor's note: The use of dredged material for a beneficial purpose could include development of port or other marine facilities, use for construction or industrial purposes, or use to create or modify land or waters for an approved environmental outcome (such as creation of a bird roosting site). Further information about beneficial uses is contained in the National assessment guidelines for dredging, Australian Government Department of Environment, Water, Heritage and the Arts, 2009	N/A	N/A
Within a strategic environmental area: riparian and wildlife corridor functions			
PO5 Natural regeneration of any cleared or work area is facilitated wherever possible.	**AO5.1** There is no impediments to the natural regeneration of native plant species in the area of clearing and works following completion of works.	☑	The existing riparian margins of the immediate works footprint will not be retained or re-established due to the nature of the revetment walls proposed. However, the opposite and upstream/downstream ecological values are not proposed to be disturbed, therefore it is considered that ecological ecosystem impacts will be minor and will continue to provide riparian margin connectivity.
Within a strategic environmental area: hydrological processes			
PO6 Development avoids or minimises impacts on natural drainage lines or flow paths, during both construction and operation.	No acceptable outcome is prescribed.	☑	Riverbank works are to be conducted by the Contractor with reference to the EMP and RPEQ approved design drawings for revetment works. Geotechnical, hydrological and ecological survey results are to be considered. The design

Performance outcomes	Acceptable outcomes	Response	Comment
			of the structures has considered flow paths and drainage lines.
Within a strategic environmental area: water quality			
PO7 Development avoids or minimises any adverse impacts on environmental values and water quality objectives for receiving waters (surface and groundwater) from pollutants on site or leaving a site located in a strategic environmental area.	**AO7.1** Development demonstrates best practice environmental management to meet relevant environmental values and water quality objectives of the Environmental Protection (Water) Policy 2009. **Or**	☑	There will be temporary disturbance, i.e. increases to turbidity and suspended sediments, to the water in the Mossman and Mossman South Rivers during revetment operational works. A water quality monitoring program, including a baseline assessment prior to construction, will be prepared and implemented by an appropriately qualified person. This monitoring program will identify threshold and trigger WQ parameters for actions, which will include hold points for construction. These works will be minimised wherever possible through implementation of the EMP, which will require measures to be in place to protect water quality and fisheries values. This will include such items as silt curtains, and timing of works. The conditions of the environmental approvals are to be addressed within the Contractor's EMP, that will manage issues related to sediment control, stockpiling, re-fuelling of machinery and handling waste for the project. This aims to demonstrate best environmental practice to comply with the Environmental Protection (Water) Policy 2009 and requirements in the environmental approval.
	AO7.2 All stormwater, wastewater, discharges and overflows leaving the site are: (1) treated to the quality of the receiving waters prior to discharge, or (2) reclaimed or re-used such that there is no export of pollutants to receiving waters.	☑	The Contractor will minimise the chance of overland flow into the Mossman and South Mossman Rivers from the works site by diverting clean water around disturbed areas and treating contaminated water prior to any run-off. The Contractor is to adhere to the EMP with respect to waste disposal, water quality and stormwater.

Table 10.1.3: Reconfiguring a lot

Performance outcomes	Acceptable outcomes	Response	Comment
PO1 Erosion prone areas in a coastal management district are maintained as development free buffers, or where permanent buildings or structures exist,	**AO1.1** Land within the erosion prone area is surrendered to the State and dedicated as a reserve for beach	N/A	Works do not involve reconfiguring a lot nor works adjacent to a beachfront area.

Performance outcomes	Acceptable outcomes	Response	Comment
coastal erosion risks are avoided or mitigated.	protection, coastal management or environmental purposes, unless: (1) the development is in a port or is for coastal-dependent development, or (2) the surrender of the land will not enhance coastal management outcomes, for example, because there is already substantial development seaward of the lot. Editor's note: Land surrendered to the State for public use under AO1.1 is to be: (1) placed in a State land reserve for beach protection and coastal management purposes under the *Land Act 1994,* with local government as trustee, or (2) managed for beach protection and coastal management purposes under another management regime to the satisfaction of the chief executive administering the *Sustainable Planning Act 2009* and *Land Act 1994*, if it is demonstrated that AO1.1(1) cannot be reasonably achieved. (3) The *Land Act 1994* also includes provisions for voluntary land surrender for freehold land to the satisfaction of the chief executive administering the *Land Act*.		
PO2 Development maintains or enhances general public access to or along the foreshore, unless this is contrary to the protection of coastal resources or public safety.	**AO2.1** Reconfiguring a lot that abuts the foreshore or tidal waters is designed to enhance public access if it involves the creation of 10 or more lots or the opening of a new road, unless it is for coastal-dependent development.	N/A	N/A. Works not within a foreshore.
PO3 Development in connection with a canal enhances public access to coastal waters.	**AO3.1** The canal avoids intersecting with land or tidal land where the passage, use or movement of vessels in water could be restricted by the registered proprietor of the land. **And**	N/A	N/A. Works not connected to a canal.
	AO3.2 The area of the canal relating to the development is surrendered to the State as a public waterway. **And**	N/A	N/A
	AO3.3 The plans of subdivision for the canal are consistent with Requirements for plans of subdivision of an artificial waterway, Department of Environment and Heritage Protection, 2013.	N/A	N/A

Appendix E – Prescribed Tidal Works Code

Coastal Protection and Management Regulation 2003 Schedule 4A: Prescribed Tidal Works Code

Specific Outcomes	Probable Solutions	Assessment Outcome for Development Applications for Prescribed Tidal Work
Character and amenity (generally) – prescribed tidal work in a canal		
1.1 Prescribed tidal work in a canal and for a private purpose is compatible with its location, having regard to the following- (a) the character and amenity of the work's immediate surroundings and the locality within which the work is located; (b) if the relevant planning scheme states the desired character or amenity for the work's immediate surroundings or the locality within which the work is located—the stated desired character or amenity.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (c), prescribed tidal work does not extend past the side boundary or extended side boundary of the lot connected to the work; (b) subject to paragraph (c), prescribed tidal work is not roofed; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b); (d) any other relevant planning scheme standard that is not inconsistent with the standards mentioned in paragraphs (a) to (c).	N/A Work is not in a canal
1.2 Prescribed tidal work in a canal and for a non-private purpose is compatible with its location, having regard to the following- (a) the character and amenity of the work's immediate surroundings and the locality within which the work is located; (b) if the relevant planning scheme states the desired character or amenity for the work's immediate surroundings or the locality within which the work is located—the stated desired character or amenity.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (c), prescribed tidal work used for a commercial purpose does not extend past the side boundary or extended side boundary of the lot connected to the work; (b) subject to paragraph (c), prescribed tidal work is not roofed unless it is the main access to land; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard stated in paragraph (a) or (b); (d) any other relevant planning scheme standard that is not inconsistent with the standards mentioned in paragraphs (a) to (c).	N/A Work is not in a canal
Character and amenity (generally) – prescribed tidal work not in a canal		
2.1 Prescribed tidal work not in a canal and for a private purpose is compatible with its location, having regard to the following -	The design and construction of the prescribed tidal work is consistent with the following standards—	N/A Works are not for a private purpose

Specific Outcomes	Probable Solutions	Assessment Outcome for Development Applications for Prescribed Tidal Work
(a) the character and amenity of the work's immediate surroundings and the locality within which the work is located; (b) if the relevant planning scheme states the desired character or amenity for the work's immediate surroundings or the locality within which the work is located—the stated desired character or amenity.	(a) subject to paragraph (e), prescribed tidal work does not extend past the side boundary or extended side boundary of the lot connected to the work; (b) subject to paragraph (e), prescribed tidal work is the only work of its type along the edge of the tidal water fronting the lot connected to the work; (c) subject to paragraph (e), prescribed tidal work that is a boardwalk or independent deck is not roofed; (d) subject to paragraph (e), prescribed tidal work other than a boardwalk or deck is not roofed unless it is the main access to land; (e) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a), (b), (c) or (d)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a), (b), (c) or (d); (f) any other relevant planning scheme standard that is not inconsistent with the standards mentioned in paragraphs (a) to (e).	
2.2 Prescribed tidal work not in a canal and for a non-private purpose is compatible with its location, having regard to the following - (a) the character and amenity of the work's immediate surroundings and the locality within which the work is located; (b) if the relevant planning scheme states the desired character or amenity for the work's immediate surroundings or the locality within which the work is located—the stated desired character or amenity.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (c), prescribed tidal work used for a commercial purpose does not extend past the side boundary or extended side boundary of the lot connected to the work; (b) subject to paragraph (c), prescribed tidal work used for a commercial purpose is not roofed unless it is the main access to land; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent the standard is more stringent than the standard mentioned in paragraph (a) or (b); (d) any other relevant planning scheme standard that is not inconsistent with the standards mentioned in paragraphs (a) to (c).	The proposed development is considered compatible with the location as it is bank protection works to protect the existing MWTP. The works are not for a commercial purpose.
Character and amenity (height, scale and size)		
3.1 Prescribed tidal work is of a height, scale and size to ensure the work is compatible with the character and amenity of its location, having regard to the following-	The height, scale and size of the prescribed tidal work is consistent with each relevant planning scheme standard.	Due to the existing land use in the immediate area being the MWTP it is considered that visual amenity impact will be minor. The scale of the development is sympathetic to

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(a) the height, scale and size of the natural features of the work's immediate surroundings and the locality within which the work is located; (b) the height, scale and size of the existing buildings or other structures in the work's immediate surroundings and the locality within which the work is located; (c) if the relevant planning scheme states the desired height, scale or size of buildings or other structures in the work's immediate surroundings or the locality within which the work is located—the stated desired height, scale or size.		the coastal relief and potential impact has been minimised by locating the revetments on the existing erosion impacted areas, and tying in the revetment with the natural bank profiles.
Character and amenity (materials and colours)		
4.1 The materials used for, and the colours of, prescribed tidal work are compatible with the character and amenity of the work's location, having regard to the following- (a) the natural features of the work's immediate surroundings and the locality within which the work is located; (b) the existing buildings or other structures in the work's immediate surroundings and the locality within which the work is located; (c) if the relevant planning scheme states the desired materials to be used for, or desired colours of, buildings or other structures in the work's immediate surroundings or the locality within which the work is located—the stated desired materials or colours.	The materials used for, and colours of, the prescribed tidal work are consistent with each relevant planning scheme standard.	The rocks used for the wall will be similar in colour to rocks used on other rock revetment works.
Lighting		
5.1 Lighting, other than an aid to navigation, for prescribed tidal work is installed in a way to ensure the security and safe use of the work without causing significant adverse effects on	The lighting for the prescribed tidal work, other than an aid to navigation, is consistent with the following standards— (a) subject to paragraph (c), lighting for prescribed tidal work is hooded and directed downwards;	N/A No lighting is proposed.

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the amenity of the locality within which the work is located.	(b) subject to paragraph (c), each lighting standard, to the extent relevant; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent the standard is more stringent than the standard mentioned in paragraph (a) or (b); (d) any other relevant planning scheme standard that is not inconsistent with the standards mentioned in paragraphs (a) to (c).	
Signage		
6.1 A sign erected or otherwise placed in position for prescribed tidal work, other than a sign erected or placed for safety reasons or under an Act- (a) is compatible with the character and amenity of the work's immediate surroundings and the locality within which the work is located; and (b) is not a dominant feature of the work, unless the dominance is for safety reasons.	A sign erected or otherwise placed in position for prescribed tidal work, other than a sign erected or placed for safety reasons or under an Act, is consistent with the following standards— (a) subject to paragraph (c), a sign erected or placed in position for identifying prescribed tidal work, or the owner of the work, is the only sign erected or placed in position for identifying the work or owner; (b) subject to paragraph (c), a sign erected or otherwise placed in position for prescribed tidal work is integrated into the design and construction of the work; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) -the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a); (d) any other relevant planning scheme standard that is not inconsistent with the standards mentioned in paragraphs (a), (b) and (c).	N/A No signs are proposed to be erected other than for safety and notification purposes for the proposed works.
Earthwork and vegetation		
7.1 Excavation and filling for prescribed tidal work - (a) is carried out only to the extent reasonably necessary for the work; and (b) does not have a significant adverse effect on - (i) the natural features of the tidal water under, within or over which the work is located; or	The earthwork and filling for the prescribed tidal work is consistent with each relevant planning scheme standard.	The excavation and filling being undertaken is to a level that is necessary for the work to provide adequate protection to the MWTP. As outlined within this application, the revetments will tie in with the natural banks and are not proposed to adversely impact upon natural water flows. Some impact may be discernible during low flow

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(ii) the level of the surface of the land under the tidal water under, within or over which the work is located, or any foreshores near the work.		conditions at the South Mossman River.
7.2 The location of prescribed tidal work ensures vegetation is cleared or disturbed only to the extent reasonably necessary for the work.	The vegetation in the tidal water, under within or over which the prescribed tidal work is located, or on land under the tidal water, is cleared or disturbed in a way consistent with each relevant planning scheme standard.	Vegetation will be required to be removed. The extent of clearing has been minimised where practical.
7.3 Any vegetation damaged, destroyed or removed by prescribed tidal work under, within or over tidal water other than an artificial waterway, is replaced with appropriate vegetation.	Vegetation affected by the prescribed tidal work is dealt with in a way consistent with the following standards- (a) subject to paragraph (b), vegetation damaged, destroyed or removed by prescribed tidal work is replaced with native vegetation for the locality within which the work is located, to the extent it is reasonably practicable to replace the vegetation with native vegetation; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) -the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a); (c) any other relevant planning scheme standard that is not inconsistent with the standards mentioned in paragraphs (a) and (b).	Vegetation will be required to be removed. The extent of clearing has been minimised where practical.
Public access — availability		
8.1 Prescribed tidal work does not have a significant adverse effect on the availability of public access to foreshores, including public access proposed in the relevant planning scheme.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (b), prescribed tidal work does not involve the erection or placement of any physical barrier preventing existing access, along a public accessway, to the foreshores near the work; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)- the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a); (c) any other relevant planning scheme standard that is not inconsistent with the standards mentioned in paragraphs (a) and (b).	N/A There is no existing public access through the subject land to the Rivers.
Public access — safety		
9.1 The location and design of prescribed tidal work does not adversely affect the safety of	Public access to foreshores near the prescribed tidal work is consistent with each relevant planning scheme standard.	N/A There is no existing public access through the subject land to the

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members of the public accessing the foreshores.		Rivers. Safety measures will be erected during construction to minimise access to the work sites.
Navigable access to, or egress from, non-tidal work lots		
10.1 Prescribed tidal work does not adversely affect navigable access to, or navigable egress from, any non-tidal work lot.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (b), if the lot connected to prescribed tidal work (the connected lot) adjoins a non-tidal work lot, the work does not extend past the connected lot's side boundary, or extended side boundary, adjoining the non-tidal work lot; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)- the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A The rivers are not navigable.
Infrastructure, including, access, parking, sewerage and water services		
11.1 Prescribed tidal work has appropriate infrastructure, including, in particular, road access, parking facilities, sewerage services and water services, having regard to- (a) the nature and scale of the work; and (b) the number of people that may be on or at the work at any time; and (c) the number of vehicles that may be on or moored at the work at any time; and (d) the protection of any foreshores near the work and the vegetation and marine plants on the foreshores.	The infrastructure for prescribed tidal work is consistent with each relevant planning scheme standard.	N/A
Design, construction and safety – all prescribed tidal work		
12.1 Prescribed tidal work is designed and constructed in a way to ensure it is structurally sound, having regard to the following - (a) relevant engineering standards;	The design and construction of the prescribed tidal work is consistent with the following standards—	The proposed works have been designed and certified by a RPEQ.

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(b) the location of the work; (c) the purpose for which the work is to be used; (d) the impact of flooding, tidal influences and hydrodynamic changes.	(a) subject to paragraph (b), each Australian Standard relevant to the design or construction of structures, to the extent requirements stated in the Standard apply to the design or construction of prescribed tidal work; (b) if a relevant planning scheme standard is more stringent than any standard mentioned in paragraph (a) -the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	
12.2 Prescribed tidal work does not adversely affect the structural integrity of any existing revetment or revetment or another existing structure.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (b), prescribed tidal work, including any shore abutment, piling or other structure connected with the work— (i) does not place an additional load on any existing revetment or revetment or another existing structure; or (ii) can be structurally supported by an existing revetment or revetment or another existing structure; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A There are no other existing revetment structures on the foreshore adjacent to the subject land.
12.3 Prescribed tidal work is designed and constructed in a way to ensure it does not adversely affect the stability of the bed and banks of any tidal water.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (b), prescribed tidal work does not cause, by changing the flow of water, the removal of, or disturbance to, the sediment on the bed and banks of any tidal water; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	The proposed revetments have been designed in consideration of the bank and beds of the rivers to minimise risk of adverse impacts after construction.
12.4 Prescribed tidal work is designed and constructed using materials having a long life in marine environments, having regard to their ability to resist the following— (a) attack by marine organisms; (b) corrosion;	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (b), each Australian Standard relevant to the materials that should be used, or the measures that should be taken to treat materials used, for structures, to the extent the requirements stated in the Standard apply to structures located in a marine environment;	The revetment will be constructed using rock which has proven to be a suitable construction material in the environment.

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(c) deterioration resulting from abrasion or immersion in seawater.	(b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)- the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	
12.5 Prescribed tidal work is designed and constructed in a way to ensure it does not adversely affect the operation or maintenance of any existing stormwater outlet.	The design and construction of the prescribed tidal work is consistent with the following standards- (a) subject to paragraph (c), vessels moored at prescribed tidal work do not impede the discharge of stormwater; (b) subject to paragraph (c), prescribed tidal work does not restrict access to any stormwater outlet; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	The proposed works do not affect any existing stormwater outlets.
12.6 Prescribed tidal work is designed and constructed in a way to ensure it does not adversely affect the water quality of any tidal water, including, in particular, as a result of- (a) release, into the tidal water, of materials used in the construction of the work; or (b) disturbance to the sediment on the bed and banks of the tidal water; or (c) exposure to acid sulfate soils.	The design and construction of the prescribed tidal work is consistent with the following standards- (a) subject to paragraph (b), each Australian Standard relevant to the design or construction of structures under, within or over tidal water, to the extent the requirements stated in the Standard are directed at maintaining the water quality of tidal water; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	During construction works, temporary increases in sediment may occur while material is excavated for the revetment. This disturbance is expected to be limited in extent and duration and is not expected to have an extended impact on water quality. The Contractor is required to develop and implement an erosion and sediment control plan. The Environmental Management Plan includes measures if acid sulfate soils are encountered. If found the Contractor may be required to develop an Acid Sulfate Soil Management Plan.
12.7 Prescribed tidal work is designed and constructed in a way to ensure it is safe for persons standing or walking on the work.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (c), any surface of prescribed tidal work on which a person may stand or walk is— (i) not slippery; and	N/A The revetment is not intended to be traversed by persons or vehicles.

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	(ii) does not have any feature that may cause the person to trip or fall; (b) subject to paragraph (c), any part of prescribed tidal work that is unsafe for persons standing or walking on the work is surrounded by adequate barriers to deter persons from entering the part; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	
12.8 Appropriate measures are taken for prescribed tidal work for a non-private purpose to ensure an unsupportable live load is not applied to the work by persons or vehicles.	The design and construction of the prescribed tidal work is consistent with the following standards— (a) subject to paragraph (b), prescribed tidal work has erected or placed in position on or near the work, a sign that- (i) is visible at all times; and (ii) states the maximum live load that may be applied to the work, in terms of the maximum number of persons that may be on the work at any given time or the maximum number of vehicles of a particular type that may be on or moored at the work at any given time; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) - the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A The revetment is not intended to be traversed by persons or vehicles.
12.9 Prescribed tidal work, other than a boardwalk or an independent deck for a private purpose, is designed and constructed in a way that ensures the use of tidal water in a canal for a non-maritime purpose is minimised.	The design and construction of the prescribed tidal work is consistent with each relevant planning scheme standard.	N/A
12.10 Prescribed tidal work that is a boardwalk or an independent deck and for a private purpose, is designed and constructed in a way that ensures the use of tidal water in a canal for a non-maritime purpose is minimised.	(s 6(2) solution) The design and construction of the boardwalk or deck is consistent with the following standards— (a) subject to paragraph (c), a boardwalk or independent deck does not extend more than 3 m from the waterfront boundary of the lot connected to the boardwalk or deck; (b) subject to paragraph (c), a boardwalk or independent deck is at least 3 m inside of the side boundary or extended side boundary of the lot connected to the boardwalk or deck;	N/A

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	(c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	
Design, construction and safety – boat ramps and slip ways for private purpose		
13.1 Prescribed tidal work that is a private boat ramp or private slip way is designed and constructed in a way to ensure it is structurally sound while also ensuring the top of each wall at the edge of the boat ramp or slip way is level with the surface of the land on which the boat ramp or slip way is located.	(s 6(2) solution) The design and construction of the boat ramp or slip way is consistent with the following standards— (a) subject to paragraph (c), the walls at the edge of a boat ramp or slip way penetrate into the earth at least 600 mm below the surface of the land on which the boat ramp or slip way is located; (b) subject to paragraph (c), the surface of a boat ramp or slip way is no more than 200 mm above the surface of the land on which it is located; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	N/A
13.2 Prescribed tidal work that is a private boat ramp or private slip way is designed and constructed in a way to ensure the safe movement of vehicles or persons over the boat ramp or slip way.	(s 6(2) solution) The design and construction of the boat ramp or slip way is consistent with the following standards— (a) subject to paragraph (d), the upper surface of a boat ramp or slip way has a width of no less than 3.6 m; (b) subject to paragraph (d), the whole upper surface of a boat ramp or slip way is treated to prevent it from becoming slippery by using any of the following methods— (i) forming grooves over the surface, as close as possible to 40 mm wide, 20 mm deep and 150 mm apart, and at an angle as close as possible to 70º to the centre-line of the boat ramp or slip way; (ii) covering the surface with a substance ordinarily used on slippery surfaces to prevent skidding; (iii) making, through a physical act, the surface coarse before it sets, including, for example, by raking the surface; (c) subject to paragraph (d), the upper surface of a boat ramp or slip way for which a winch is not used to hoist or haul vessels onto the boat ramp or slip way is at a gradient of not steeper than—	N/A

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	(i) if the surface is treated by using a method mentioned in paragraph (b)(i) or (ii)—1:8; or (ii) otherwise—1:10; (d) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a), (b) or (c)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a), (b) or (c).	
Design, construction and safety – bridges		
14.1 Prescribed tidal work that is a bridge does not adversely affect existing public use of any tidal water, including, for example, use of the tidal water for canoeing, swimming or other recreational activities.	The design and construction of the bridge, including any abutment connected with the bridge, is consistent with the following standards— (a) subject to paragraph (b), the clearance levels under a bridge are high enough to allow continued public use of any tidal water over which it is constructed; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A
14.2 Prescribed tidal work that is a bridge does not adversely affect the flow of water under the bridge.	The design and construction of the bridge is consistent with the following standards— (a) subject to paragraph (b)— (i) if a bridge can be adequately supported without erecting or placing a foundation support in tidal water—no foundation support to support the bridge is erected or placed in the tidal water; or (ii) otherwise—only the minimum number of foundation supports required to support the bridge is used; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A
Design, construction and safety – boardwalks and independent decks		
15.1 Prescribed tidal work that is a boardwalk or an independent deck and for a private purpose is designed and constructed in a way to ensure it is able to support its intended loads, having regard to its relevant loading matters.	(s 6(2) solution) The design and construction of the boardwalk or deck is consistent with the following standards—	N/A

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	(a) subject to paragraph (d), a boardwalk or independent deck accessible to vehicular traffic is able to support at least a live load of 3.0 kPa plus an axle load of 10 kN; (b) subject to paragraph (d), a boardwalk or independent deck that is not accessible to vehicular traffic and that is for individual use is able to support at least a live load of 2.0 kPa; (c) subject to paragraph (d), a boardwalk or independent deck that is not accessible to vehicular traffic and that is for group use is able to support at least a live load of 3.0 kPa;	
15.2 Prescribed tidal work that is a boardwalk or an independent deck and for a non-private purpose is designed and constructed in a way to ensure it is able to support its intended loads, having regard to its relevant loading matters.	(s 6(2) solution) The design or construction of the boardwalk or deck is consistent with the following standards— (a) subject to paragraph (c), a boardwalk or independent deck accessible to vehicular traffic is able to support at least the following— (i) a distributed live load of 5.0 kPa; (ii) a concentrated live load of 4.5 kN; (iii) the load of the largest vehicle capable of being on the boardwalk or deck; (b) subject to paragraph (c), a boardwalk or independent deck not accessible to vehicular traffic is able to support at least the following— (i) a distributed live load of 5.0 kPa; (ii) a concentrated live load of 4.5 kN; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	N/A
15.3 Prescribed tidal work that is a boardwalk or an independent deck does not prevent or hinder remedial work being undertaken on any bank of tidal water or for any existing retaining wall, revetment or revetment or another existing structure.	The design and construction of the boardwalk or deck is consistent with the following standards— (a) subject to paragraph (b), a boardwalk or independent deck either— (i) can be easily dismantled and reassembled; or (ii) does not restrict the movement of machinery ordinarily used for remedial work to any bank of tidal water or any existing retaining wall, revetment or revetment or other existing structure;	N/A

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	(b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	
Design, construction and safety – jetties and piers		
16.1 Prescribed tidal work that is a jetty or pier and for a private purpose is designed and constructed in a way to ensure it is able to support its intended loads, having regard to its relevant loading matters.	(s 6(2) solution) The design and construction of the jetty or pier is consistent with the following standards— (a) subject to paragraph (d), a jetty or pier accessible to vehicular traffic is able to support at least a live load of 3.0 kPa plus an axle load of 10 kN; (b) subject to paragraph (d), a jetty or pier that is not accessible to vehicular traffic and that is for individual use is able to support at least a live load of 2.0 kPa; (c) subject to paragraph (d), a jetty or pier that is not accessible to vehicular traffic and that is for group use is able to support at least a live load of 3.0 kPa;	N/A
16.2 Prescribed tidal work that is a jetty or pier and for a non-private purpose is designed and constructed in a way to ensure it is able to support its intended loads, having regard to its relevant loading matters.	(s 6(2) solution) The design and construction of the jetty or pier is consistent with the following standards— (a) subject to paragraph (c), a jetty or pier accessible to vehicular traffic is able to support at least the following— (i) a distributed live load of 5.0 kPa; (ii) a concentrated live load of 4.5 kN; (iii) the load of the largest vehicle capable of being on or moored at the jetty or pier; (b) subject to paragraph (c), a jetty or pier not accessible to vehicular traffic is able to support at least the following— (i) a distributed live load of 5.0 kPa; (ii) a concentrated live load of 4.5 kN; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	N/A

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16.3 Prescribed tidal work that is a jetty or a pier is designed and constructed in a way to ensure it remains above water at all times.	The design and construction of the jetty or pier is consistent with the following standards— (a) subject to paragraph (b), either— (i) the level of the deck of a jetty or pier is at least 300 mm above the water at highest astronomical tide; or (ii) piles or other markers indicate the presence of the jetty or pier when it is inundated; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A
16.4 Prescribed tidal work that is a jetty or pier and for a private purpose is designed and constructed in a way to ensure it is of a size suitable for maritime use while still minimising the amount of tidal water occupied by it.	(s 6(2) solution) The design and construction of the jetty or pier is consistent with the following standards— (a) subject to paragraph (b), all parts of the deck of a jetty or pier have a width of at least 900 mm and not more than 3 m; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A
Design, construction and safety – pipelines and other underground services		
17.1 The design and construction of prescribed tidal work that is a pipeline, or another underground service used instead of a pipeline, does not adversely affect the ability of vessels to be anchored near the work.	(s 6(2) solution) The design and construction of the pipeline or underground service is consistent with the following standards— (a) subject to paragraph (b), a pipeline or other underground service is installed at least 1.2m below the surface of land, after it is installed; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A
Design, construction and safety – pontoons		
18.1 Prescribed tidal work that is a pontoon, for a private purpose, and not used only for rowing, is designed and constructed in a way to ensure	(s 6(2) solution) The design and construction of the pontoon is consistent with the following standards—	N/A

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it is able to support its intended loads, having regard to its relevant loading matters.	(a) subject to paragraph (c), a pontoon for individual use is able to support at least a live load of 1.5kPa; (b) subject to paragraph (c), a pontoon for group use is able to support at least a live load of 2.0kPa; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	
18.2 Prescribed tidal work that is a pontoon, for a non-private purpose, and not used only for rowing, is designed and constructed in a way to ensure it is able to support its intended loads, having regard to its relevant loading matters.	(s 6(2) solution) The design and construction of the pontoon is consistent with the following standards— (a) subject to paragraph (c), a pontoon open for use by the general public or used for a commercial purpose is able to support at least the following— (i) a distributed live load of 3.0kPa; (ii) a concentrated live load of 4.5kN; (b) subject to paragraph (c), a pontoon other than a pontoon mentioned in paragraph (a) is able to support at least the following— (i) a distributed live load of 2.0kPa; (ii) a concentrated live load of 4.5kN; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	N/A
18.3 Prescribed tidal work that is a pontoon and used only for rowing is designed and constructed in a way to ensure- (a) it is able to support its intended loads, having regard to its relevant loading matters; and (b) it is safe for persons using the pontoon to launch and retrieve rowing vessels.	(s 6(2) solution) The design and construction of the pontoon is consistent with the following standards— (a) subject to paragraph (c), the access walkway of a pontoon used only for rowing is able to support at least a live load of 3.0 kPa; (b) the flotation unit of a pontoon used only for rowing is able to support at least a live load of 1.5 kPa; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	N/A

Specific Outcomes	Probable Solutions	Assessment Outcome for Development Applications for Prescribed Tidal Work
18.4 Prescribed tidal work that is a pontoon is designed and constructed in a way to ensure any load applied to the pontoon by a person or thing on the pontoon does not cause the pontoon to tip over or tilt to a degree causing the person or thing to fall off the pontoon.	(s 6(2) solution) The design and construction of the pontoon is consistent with the following standards— (a) subject to paragraph (f), a pontoon's access walkway extends at least 500 mm onto the pontoon's flotation unit; (b) subject to paragraph (f), a pontoon's access walkway is constructed with a material that has a non-slippery surface; (c) for a pontoon used only for rowing—subject to paragraph (f), at least 75 mm of the height of the pontoon's flotation unit remains above the water over which it is constructed if a distributed live load is applied to half of the surface of the pontoon's flotation unit and all of the surface of the pontoon's access walkways; (d) for a pontoon other than a pontoon mentioned in paragraph (c)—subject to paragraph (f), the top surface of the pontoon's flotation unit remains above the water over which it is constructed if a distributed live load of 1.5kPa is applied to half of the surface of the pontoon's flotation unit and all of the surface of the pontoon's access walkways; (e) subject to paragraph (f), the whole base of the pontoon's flotation unit remains in contact with the water over which it is constructed at all times and tilts no more than 15º at any time; (f) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a), (b), (c), (d) or (e)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a), (b), (c), (d) or (e).	N/A
18.5 Prescribed tidal work that is a pontoon is designed and constructed in a way to ensure it remains above the water at all times.	The design and construction of the pontoon is consistent with the following standards— (a) subject to paragraph (b), the pontoon's abutment is located no less than 300 mm above the water at high water mark; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A
18.6 Prescribed tidal work that is a pontoon is designed and constructed in a way to ensure	The design and construction of the pontoon is consistent with the following standards— (a) subject to paragraph (c), the pontoon's flotation unit is—	N/A

Specific Outcomes	Probable Solutions	Assessment Outcome for Development Applications for Prescribed Tidal Work
the pontoon's flotation unit will rise and fall to allow for changes in tidal water levels.	(i) attached, through the pontoon's system for mooring the unit, to concrete anchors in the bank landward of the pontoon; or (ii) moored by piles; (b) subject to paragraph (c), if a tidal water level change resulting from a 1% probability flood event would cause a pontoon's flotation unit to detach from the system for mooring the unit— (i) the standard applying under paragraph (a); and (ii) the pontoon's flotation unit is restrained with a tethering system so that it can withstand the effects of the event; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	
18.7 Prescribed tidal work that is a pontoon identifies the lot to which the pontoon is connected.	(s 6(2) solution) The design and construction of the pontoon is consistent with the following standards— (a) a label that identifies the lot to which the pontoon is connected is written or stamped on, or fixed to, the outside of the pontoon's flotation unit; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	N/A
Design, construction and safety – retaining walls, revetments and revetments		
19.1 Prescribed tidal work that is a retaining wall, revetment or revetment, is designed and constructed in a way to ensure it is able to support its intended loads, having regard to its relevant loading matters.	(s 6(2) solution) The design and construction of the retaining wall, revetment or revetment is consistent with the following standards— (a) subject to paragraph (b), a retaining wall, revetment or revetment is able to support at least a distributed live load of 3.0kPa; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) - the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	The revetment has been designed in accordance with relevant guidelines given its intended purpose.
19.2 Prescribed tidal work that is a retaining wall, revetment or revetment, is designed and	(s 6(2) solution)	The revetment has been designed in accordance with relevant

Specific Outcomes	Probable Solutions	Assessment Outcome for Development Applications for Prescribed Tidal Work
constructed in a way to ensure it can withstand— (a) any tendency of overturning or sliding; and (b) any other effects of waves or changes in water levels on the retaining wall, revetment or revetment.	The design and construction of the retaining wall, revetment or revetment is consistent with the following standards— (a) subject to paragraph (c), a retaining wall, revetment or revetment has a factor of safety of no less than 1.5; (b) subject to paragraph (c), a retaining wall, revetment or revetment is able to withstand the effect of waves, or waves and water levels, resulting from a storm or other natural event of a magnitude that has a 2% or lower probability of occurring in any calendar year; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	guidelines given its intended purpose.
19.3 Prescribed tidal work that is a retaining wall, revetment or revetment not founded upon rock, is designed and constructed to protect the seaward side of retaining wall, revetment or revetment from erosion.	(s 6(2) solution) The design and construction of the retaining wall, revetment or revetment is consistent with the following standards— (a) subject to paragraph (c), a retaining wall, revetment or revetment provides for a sub-layer or enough filter material to ensure it is reasonably likely to remain in place for at least 50 years; (b) subject to paragraph (c), the bottom edge of the base of a retaining wall, revetment or revetment is reasonably likely to prevent any adverse effects from potential erosion of the soil under the retaining wall, revetment or revetment for at least 50 years; (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	The design life of the revetment is 50 years. The toe of the revetments has been designed to be at a level below the likely scour depth in front of the walls, and with sufficient rock in the toe such that the wall is protected from undermining in the event that the scour depth in front of the wall is greater than the designed toe level, during the design life of the wall.
19.4 Prescribed tidal work that is a retaining wall, revetment or revetment, is not adversely affected by hydrostatic pressure behind the retaining wall, revetment or revetment.	The design and construction of the retaining wall, revetment or revetment is consistent with the following standards— (a) subject to paragraph (b), a retaining wall, revetment or revetment provides for drainage holes, and suitable filter material behind the holes, to relieve any hydrostatic pressure behind the retaining wall, revetment or revetment; (b) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a).	The revetment has been designed to allow for the free drainage of water behind the wall so as to minimise the risk of failure due to hydrostatic pressure behind the wall.

Specific Outcomes	Probable Solutions	Assessment Outcome for Development Applications for Prescribed Tidal Work
Design, construction and safety – wharves		
20.1 Prescribed tidal work that is a wharf is designed and constructed in a way to ensure it is able to support its intended loads, having regard to its relevant loading matters.	(s 6(2) solution) The design and construction of the wharf is consistent with the following standards— (a) subject to paragraph (c), a major wharf, or a minor wharf accessible to vehicular traffic, is able to support at least the following— (i) a distributed live load of 5.0kPa; (ii) a concentrated live load of 13kN; or (b) subject to paragraph (c), a minor wharf not accessible to vehicular traffic is able to support at least the following— (i) a distributed live load of 5.0kPa; or (ii) a concentrated live load of 4.5kN; or (c) if a relevant planning scheme standard is more stringent than the standard mentioned in paragraph (a) or (b)—the relevant planning scheme standard, to the extent it is more stringent than the standard mentioned in paragraph (a) or (b).	N/A

Appendix F – Preliminary Environmental Management Plan

Douglas Shire Council

Mossman Waste Water Treatment Plant

Remedial Works Environmental Management Plan

June 2017

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1. Introduction

Douglas Shire Council (DSC) are undertaking riverbank stabilisation works to assist in asset protection of the Mossman Wastewater Treatment Plan (MWTP). GHD has developed this preliminary Environmental Management Plan (EMP) for the Project.

1.1 Purpose of the Preliminary EMP

The purpose of this EMP is to enable DSC and their Contractor(s) to fulfil environmental management requirements for the MWTP riverbank stabilisation project. This document will outline how activities on the site will be managed, to minimise potential harm to surrounding and receiving environments.

The aims of the EMP are to ensure:

- Effective and efficient environmental management is carried out through construction of the riverbank stabilisation works for safe ongoing future operations of MWTP
- Compliance with all Commonwealth and State Legislation
- Evidence of practical and achievable Environmental Management Strategies for implementation in this project, to ensure monitoring, auditing, reporting and control of construction impacts.

This EMP contains:

- Background and details of the works to be undertaken
- Federal and State Legislative requirements and compliance measures
- DSC's Environmental Obligations, incorporating their environmental policy and objectives
- A project specific Environmental Impact Assessment Register (Risk Assessment) and
- Environmental Management Strategy for implementation to complete the riverbank stabilisation works on the Mossman and South Mossman Riverbanks adjacent to MWTP.

1.2 Reviews and Update

This EMP may be reviewed and/or updated to incorporate relevant requirements on successfully obtaining third party approvals prior to construction occurring. This EMP is to be the minimum requirements for the Contractor to implement on site. A Contractors Construction EMP (CEMP) should be developed by the Contractor to provide further construction specific measures when alternative methodologies are known.

For the duration of project works (i.e. tender through to completion), this EMP and/or the Contractors CEMP, (if developed) shall be reviewed and updated as required, to ensure that it is current and addresses any changes, including:

- Information or discoveries occurring after the preparation of the original EMP
- Site conditions or requirements
- Statutory requirements or community expectations
- Construction and/or operational activities, technology or equipment
- Contractor guidelines, policies or procedures.

Review and update of the relevant EMP shall also be triggered where any project activities have potential for environmental impact, which is not sufficiently controlled through existing management practices.

Review and update of the relevant EMP is to provide for continuous improvement. Compliance auditing will primarily be the responsibility of the Contractor, with any identified changes or deficiencies being promptly addressed and new revisions of the EMP issued as necessary.

1.3 Contact Details

The Contractors CEMP is to include contact details for (at a minimum):

- Key DSC personnel
- Key Contractor personnel
- Department of Environmental and Heritage Protection (EHP) pollution hotline: 1300 130 372
- RSPCA Queensland: 1300 264 625 (for reporting risk of orphaned wildlife) or a local wildlife carer
- Aboriginal party Eastern Kuku Yalanji People / Jabalbina Yalanji Aboriginal Corporation RNTBC Cairns: (07) 4051 1400.

1.4 Project Details

1.4.1 Location

MWTP is located approximately 0.5 km northeast of the town of Mossman, off Junction Road / Bonnie Doon Road. The site lies upstream of the confluence of two rivers, the Mossman River that flows to the west of the site and the South Mossman River that flows to the east of the site. The confluence of the two rivers is approximately 0.3 km northeast of the MWTP.

The MWTP site is relatively level with an elevation of approximately 8.50 m AHD and is approximately 140 m in length and 40 m in width on each riverbank of the Mossman and South Mossman Rivers. To the northwest and southeast, the site slopes steeply toward the two river channels that bound the site, a chainlink fence is located at the crest of these slopes. The two rivers that bound the site lie at approximately -0.50 m AHD. The flood level for the site is understood to be 6.76 mAHD.

The area of proposed works where riverbank scouring has occurred along the banks of the Mossman and South Mossman River's, can be located with reference to the RPEQ approved design drawings located in Appendix B of the MWTP Environmental Approvals Supporting Document.

1.4.2 Current Environment / Use

MWTP has been in operation since the 1960's on Junction Road Reserve, located between the Mossman and South Mossman River's. Costs to relocate the WTP to a new site far outway the costs required to stabilise the existing banks, enabling MWTP to continue STP operations in their current location, without the existing significant risks posed from riverbank scouring.

The river banks of both the Mossman River and the South Mossman River have ongoing scouring which has created slope instability issues that threaten MWTP infrastructure. The current situation has the scour on the South Mossman River now effectively undermining the security fence on the eastern side of the MWTP, immediately adjacent to the clarifier tanks.

Figure 1 Bank Erosion

Bank slumping as a result of river scouring now undermining South Mossman River side security fencing.

1.4.3 Proposed Works

DSC propose to stabilise the riverbank with revetment works as per RPEQ approved drawings in Appendix B of the MWTP Environmental Approvals Supporting Report.

Excavation and filing of the body of the revetment from toe to the crest and wall slope will occur utilising earthmoving equipment on a floating platform due to site access issues and to allow for fish movement. Revetment works will utilise rock suitable for construction in a freshwater / estuarine environment.

It is proposed that approximately 1,820 m^2 on the Mossman Riverbank and 2,230 m^2 on the South Mossman Riverbank is required to be cleared to conduct works. There are no works crossing either river from bank to bank, however increased turbidity and suspended solids is expected. Section 6 of this document outlines the Environmental Management Strategies that must be adhered to, or alternatively the Contractors CEMP to ensure compliance with the Development Approval (DA).

1.5 Scope and Limitations

This report: has been prepared by GHD for Douglas Shire Council and may only be used and relied on by Douglas Shire Council for the purpose agreed between GHD and the Douglas Shire Council as set out in this report.

GHD otherwise disclaims responsibility to any person other than Douglas Shire Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible. The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared. The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Douglas Shire Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Legislation

2.1 Regulatory Requirements

An Operation works approval for waterway barrier works and works within a Coastal Management District is in the process of being obtained (refer to Table 1). In addition to the requirements of the DA, there are other legislative requirements that are to be met. These are summarised in Table 1 and further detail is provided following.

Table 1: Summary of Applicable Legislation

Legislation	Responsible Authority	Activity	License / Permit / Approval
Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)	Department of Environment	Action that has, will have, or is likely to have a significant impact on any of the Matters of National Environmental Significance (MNES).	**Not applicable** Based on a desktop assessment it is unlikely that the project will have significant impact upon MNES.
Aboriginal Cultural Heritage Act 2003	Department of Aboriginal and Torres Strait Islander and Multicultural Affairs	Require those conducting activities in areas of significance to take all reasonable and practical measures to avoid harming cultural heritage.	**Generally applicable** The search of the Aboriginal Cultural Heritage Database and Register did not identify and values or sites in proximity. Duty of care Guidelines to be complied with (e.g. consultation with local Aboriginal Party and cease work if items found).
Coastal Protection and Management Act 1995	Department of Environment and Heritage Protection (EHP)	Works that are tidal works	**Applicable** Works are in a Coastal Management District (CMD). South Mossman River is considered to be tidally influenced. Prescribed tidal works approval will be required. An application has been lodged.
		Works where interfering with quarry material on state land above the high water mark occurs.	**Applicable** The revetment works involve interfering with soils and material located above the high water mark on state land (i.e. road reserve and waterway). An application has been lodged.
		Works where removal of quarry material from land below the high-water mark occur.	**Not applicable** It is considered that the works within the rivers will not meet the requirements of tidal water as per the definition provided within the EHP Guideline – Allocation of quarry material.

Legislation	Responsible Authority	Activity	License / Permit / Approval
Environmental Protection Act 1994	EHP	Where 'serious and material environmental harm' is caused or threatened.	**Generally applicable** Duty of Care and Duty to Notify.
		Requiring Environmentally Relevant Activities (ERAs) (prescribed activities are generally industrial activities but also include some agricultural activities) to be licenced.	**Not applicable** No approvals and amendments for ERAs anticipated for the works associated with this Project.
Fisheries Act 1994	Department of Agriculture and Fisheries	Works within waterways that involve erecting a barrier to fish movement across a watercourse.	**Applicable** Development approval for waterway barrier works is triggered. An application has been lodged.
		Works that involve the removal, destruction or damage of marine plants.	**No application** A site survey has identified that no marine plants are within the Project footprint.
Native Title Act 1993 (Commonwealth) *Native Title (Queensland) Act 1993*	Department of Natural Resources and Mines	Suppression of Native Title Rights and Interests that is inconsistent with the riverbank stabilisation works.	**Applicable** The South Mossman River waterway tenure is subject to Native Title.
Nature Conservation Act 1992	Department of Environment and Heritage Protection	Removal or disturbance of protected flora.	**Not applicable** A flora survey was undertaken and no protected flora species were identified in Project footprint. An exemption notification is being sought separately.
		Disturbance to animal breeding places	**Applicable** No protected fauna species habitat was observed, however least concern animal breeding places (such as bird nests) may be within the Project footprint. A fauna spotter catcher will be required for clearing works.
Queensland Heritage Act 1992	Department of Environment and Heritage Protection	Works associated with places registered under the Act. Incidental discovery of artefacts and their protection.	**Not applicable** No places identified in the desktop search.
State Development and Public Works Organisation Act 1971	Department of State Development, Infrastructure and Planning	Only applicable to works deemed state significant under the Act.	**Not applicable** This project is not a state significant project.

Legislation	Responsible Authority	Activity	License / Permit / Approval
Sustainable Planning Act 2009 *Sustainable Planning Regulation 2009*	Department of State Development, Infrastructure and Planning	Provides legislative framework for assessment process.	**Applicable** The project requires operational works approval for triggers identified in the Sustainable Planning Regulation 2009. An application has been lodged.
Transport Infrastructure Act 1994	Department Transport and Main Roads	Work within, in relation to or within 25 m of road reserves or rail land.	**Not applicable** No portions of land associated with this Project are within 25 m of a state-controlled road corridor (the closest is the Captain Cook Highway >400 m west of the Project) or rail land.
Vegetation Management Act 1999	Department of Natural Resources and Mines	Clearing of native vegetation.	**Not applicable** Mapped Category R vegetation will be cleared as part of these works. Clearing within the road reserve is considered exempt. Clearing within adjoining freehold parcels is considered exempt.
Water Act 2000	Department of Natural Resources and Mines	Destroy vegetation, excavate or place fill in a watercourse. Taking or interfering with water flow.	**Applicable** Mossman River and South Mossman river are defined as watercourses. Works to occur in accordance with the Riverine Protection Permit Exemption Requirements. No works proposed for the extraction of water.

2.2 Aboriginal Cultural Heritage Act 2003

In Queensland, both Commonwealth and State legislation protect Indigenous cultural heritage. Three pieces of Commonwealth legislation serve to protect Australia's heritage. These are the EPBC Act, the *Aboriginal Cultural Heritage Act 2003* (Commonwealth) and the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*. The primary piece of Queensland legislation protecting Aboriginal cultural heritage sites is the *Aboriginal Cultural Heritage Act 2003* (Queensland).

Measures are required to be put in place to comply with the duty of care under the *Aboriginal Cultural Heritage Act 2003*. If at any time during the works DSC, or their Contractors, excavate, relocate, remove or harm a cultural heritage find, DSC will notify Jabalbina Yalanji Aboriginal Corporation RNTBC or DATSIP immediately and seek their advice on how best to proceed.

2.3 Environmental Protection Act 1994

The *Environmental Protection Act 1994* (EP Act) and the subordinate Environmental Protection Regulation 2008 (EP Reg) provide the principal environmental protection legislation for Queensland.

Schedule 2 of the EP Reg includes activities that constitute Environmentally Relevant Activities (ERA). This Project does constitute an ERA and as such approval is not be required.

However, the operation of the MWTP and the construction of the Project is to comply with the requirements of DSC, relevant Australian Standards and the general environmental provisions of the EP Act.

The General Environmental Duty is defined in section 319 of the EP Act as:

" *(1) a person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm (the general environmental duty)*

(2) in deciding the measures required to be taken under subsection (1), regard must be had to, for example-

(a) the nature of the harm or potential harm; and

(b) the sensitivity of the receiving environment; and

(c) the current state of technical knowledge for the activity; and

(d) the likelihood of successful application of the different measures that might be taken; and

(e) the financial implications of the different measures as they would relate to the type of activity."

This management plan is designed to meet the requirements of the EP Act including:

- Identification of objectives to be achieved and maintained
- State how the objectives are to be achieved taking into account:
  - The best practice environmental management for the activity
  - The risks of environmental harm being caused by the activity
  - Provisions for monitoring and reporting.

2.3.1 Environmental Protection Policies

A number of Environmental Protection Policies are relevant to the site and these are:

- *Environmental Protection (Air) Policy 2008* whereby Schedule 1 applies
- *Environmental Protection (Noise) Policy 2008* whereby Schedule 1 applies
- *Environmental Protection (Water) Policy 2009* – whereby Schedule 1 applies noting the adoption of environmental values and water quality objectives listed for the Mossman-Daintree River Basin.

2.4 Fisheries Act 1994

As identified, a Development Application has been lodged to address waterway barrier works. The application covers the anticipated construction methodology. However, if additional temporary waterways barriers are required the Contractor is to review and apply the DAF Code for self-assessable development: Temporary waterway barrier works (WWBW02). The requirements of the code include notification to DAF and other conditions. Note, these have not been fully addressed within this EMP.

2.5 Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NC Act) and associated *Nature Conservation (Wildlife Management) Regulation 2006* (NC Wildlife Reg) provide a framework for the conservation of nature in Queensland. One of the primary mechanisms by which this objective is to be achieved is through the declaration of and the specification of management principles and intents for wildlife species of particular conservation significance.

Under the NC Act all native wildlife is protected. The NC Wildlife Reg lists the conservation status of protected wildlife and the principals governing its taking and use.

Protected Plants

During the site survey no protected plants were identified in the proposed works area. Therefore a Clearing Permit has not been obtained. However, if DSC or their Contractor become aware of a protected plant, work is to cease and the requirements of the EHP Flora Survey Guidelines are to be met, (including obtaining a Clearing Permit where applicable).

Animal Breeding Places

Under the NC Act all native wildlife is protected. The NC Wildlife Reg lists the conservation status of protected wildlife, and the principles governing its taking and use. Under Section 332 of the NC Wildlife Reg, any activity that will tamper with (i.e. remove, damage, impair or degrade) the confirmed breeding place of a native animal (i.e. EVNT and Least Concern wildlife) requires a Species Management Program (SMP) or Damage Mitigation Permit (DMP) in order for clearing to occur.

Animal breeding places for protected, colonial breeding or special least concern species was not observed onsite. However there is potential for least concern animal breeding places (i.e. birds nests) to be present. At a minimum, a fauna spotter catcher will be required for all clearing. A low risk Species Management Program may also be required.

2.6 Water Act 2000

The *Water Act 2000* (Water Act) regulates destruction of vegetation (Part 4 Division 3 Section 225), excavation or placing of fill in a watercourse, (Part 4 Division 1 Section 218) and taking or interfering with water flow with respect to riverine protection (Part 3 Division 1 Subdivision 1 Section 98 and 99). The Water Act also regulates ownership of quarry materials (Part 5 Division 1 Section 226).

Although the waterways are within the Coastal Management District the Water Act applies to certain parts of the rivers and for this project revetment works on the Mossman and South Mossman River banks.

As per pre-lodgement advice SPL-1216-035975, DSC can excavate material from, or place fill in the Mossman and South Mossman Rivers without approval, if the works can be undertaken in accordance with the document “Riverine protection permit exemption requirements” WSS/2013/726 Version 1.02 dated 06/12/2016, which DSC shall fulfil.

3. Environmental Obligations

DSC aims to implement and foster environmentally responsible management of its activities and to comply with all relevant environmental legislation and as such, will meet its obligations under the EP Act.

3.1 Environmental Policy

DSC is committed to minimising the impact of its activities on the environment as much as practicable, while maintaining the current level of services provided to its clients.

DSC aims to work towards Best Practice Environmental Management for all of its activities within the financial constraints and logistical restrictions imposed on MWTP within a shire council.

DSC's Environmental Policy incorporates a commitment to:

- complying with all relevant legislation, regulations and policies
- improving environmental performance.

The purpose of the Environmental Policy is to establish an overall approach for DSC to achieve responsible environmental management of the land that it utilises.

DSC is committed to Environmental Management which:

- meets at least and strives to exceed the minimal acceptable requirements of the EP Act in its management of activities in relation to the environment
- requires those who utilise the MWTP facility to meet the minimal requirements in the treatment of the environment associated with the premises
- implements and maintains environmental review procedures
- establishes a framework where all activities, current and proposed, can be assessed against minimum environmental requirements, ensuring that those requirements are met on a consistent and sustained basis.

DSC will ensure that all employees, operators and lessees are aware of the policy and the commitment to the environment.

3.2 Environmental Objectives

DSC environmental objectives are to:

- ensure that all activities comply with this management plan
- minimise impacts from the on-site activities to receiving environments
- provide an appropriate level of environmental management for DSC's activities
- raise staff awareness of the importance of implementation of this management plan.

3.3 Implementation

This preliminary EMP or a potential Contractors CEMP, must not be implemented or amended in any way that contravenes any conditions of the DA, or associated project permit or licence.

3.4 Training, Awareness and Competence

All personnel involved in the construction process shall be required to attend a compulsory induction before commencing any work at the site. The environmental component of the induction shall include (but not be limited to) the following items:

- All staff shall be made aware of their GED and Duty to Notify responsibilities as per the EP Act and the implications of failing to fulfil these duties.
- All staff shall be made aware of their environmental responsibilities under this EMP or a possible Contractors CEMP in relation to implementing mitigation measures, reporting environmental incidents and complaints and implementing corrective actions.
- All staff shall be given instructions on environmental emergency response procedures (i.e. spill kit locations and usage).

3.5 Communication

The EMP or a possible Contractors CEMP shall outline requirements to be in task specific “tool box” meetings, which are to be performed prior to undertaking work. As part of the meeting, the tasks shall be reviewed with consideration given to changes in construction activities and conditions, such as weather, which may cause the proposed activities to impact on the environment and safety.

All external communication pertaining to environmental management is to be considered by the Project Manager for DSC or in accordance with applicable contractual obligations.

3.6 Records

All records shall be retained as a hard copy and electronically by the Contractor and include the following:

- Induction and any specific environmental training records
- Any records pertaining to any approval, permit or licence
- Monitoring records and external environmental reports
- Environmental incidents, complaints and non-conformance and corrective action reports.

Records shall be made available to the Administering Authority and/or DSC as requested. All records shall be kept for a minimum of five years or as required by relevant third party approval conditions.

4. Roles and Responsibilities

To achieve the overall objective of sound environmental management and construction of the riverbank stabilisation and revetment works, with the least possible impact on the environment, a clear implementation and management structure is required.

The following section provides an overview of the Contractors minimum implementation structure for the project relating to environmental responsibilities. Specific roles and responsibilities shall be included in duty statements.

4.1 Contractors Project Manager

The Contractors Project Manager shall maintain ultimate responsibility for the provision of suitable resources (e.g. financial, personnel, etc.) to ensure that project activities comply with all applicable legal requirements and best practice. The Project Manager shall support all project personnel in the development and implementation of this EMP or a possible Contractors CEMP. The Project Manager may delegate responsibilities to appropriately qualified personnel where appropriate.

The Project Manager's responsibilities are to:

- Ensure that all personnel are familiar with this EMP or a possible Contractors CEMP and are aware of their environmental responsibilities.
- Ensure that all personnel operate in accordance with this EMP or a possible Contractors CEMP, statutory approvals and legislative requirements.
- Ensure necessary guidance and advice is provided to all personnel with regard to environmental management requirements.
- Ensure staff are appropriately qualified and trained regarding the requirements and responsibilities of this or a possible Contractors CEMP.
- Provide for a site induction, (which includes environmental responsibilities) that is mandatory for all staff and contractors.
- Ensure that all relevant licenses/permits/approvals are in place prior to any works being undertaken (if required).
- Monitor and review (where required) environmental performance during construction of the project.
- Where necessary, coordinate and/or assist in the response to environmental incidents through implementation of corrective actions.
- Report environmental incidents to the DSC Project Manager and the relevant Administering Authority.
- Record and maintain a database detailing environmental incidents and non-conformances including corrective actions taken.

4.2 Contractors Site Supervisor

The Site Supervisor:

- Implement and comply with this or a possible Contractors CEMP, statutory approvals, legislative requirements, Australian Standards and any relevant Code of Practice and/or Industry Standard.

- Provide a site induction (which includes environmental responsibilities) to all staff involved in construction activities.
- Provide portable toilets onsite if required and ensure that maintenance and disposal of waste is conducted by a licensed contractor as required.
- Ensure all vehicles arriving onsite utilise the designated entry/exit points and parking area. Ensure that all equipment is fuelled, maintained and 'fit for purpose' for the required task prior to arriving at the site.
- Notify the DSC Project Manager of environmental incidents and corrective actions taken (if any).

4.3 All Staff

All staff are responsible for ensuring they comply with the EMP or a possible Contractors CEMP, their General Environmental Duty (GED) and Duty to Notify in accordance with the EP Act.

5. Environmental Impact Assessment Register

5.1 Purpose of the Environmental Impact Register

An environmental risk assessment is presented in the form of an environmental impact assessment register and in summary covers the following:

a) An assessment of the likely risk of failure of the proposed mitigation measures causing an environmental incident.
   - Identifying worse case scenarios e.g. leakage from sediment ponds into adjacent local waterways (Mossman River and Mossman South River).
   - Emergency situations, e.g. excessive rainfall creating a muddy bank with sediment loss from further riverbank erosion and potential hazards for contractors.
   - Contractor awareness of snakes and crocodiles whilst completing all revetment works.

b) Identifies the mitigation and management measures to avoid or reduce the environmental risk.

c) Nominates procedures for contingency plans based on the finding of the risk assessment.

5.2 Risk Assessment Methodology

The environmental impact register is a tool to identify the impacts that have the potential to occur as a result of the riverbank stabilisation works and to identify those management and mitigation measures that DSC and the Contractor will implement to reduce the overall risk to the environment.

This environmental impact register is written with regard to discharges from the bank stabilisation works (either deliberate or accidental) to the receiving environment, both land and water, impacts to fish movements and vegetation clearing. This may include:

- Discharges arising from excavation and revetment activities, including machinery oil, riverbank fines sediments, overflow from works area etc.
- Stormwater and overland flow
- Sediment arising from erosion events
- Impacts to fish movements and aquatic fauna
- Accidental clearing or over clearing of native vegetation in particular endangered regional ecosystems
- Disturbance to animal breeding places and movement.

The criteria used to identify the risks, impacts and residual impacts are described in the following paragraphs.

5.2.1 Impact Risk Rating Method

Risk ratings are providing by assessing the likelihood and the consequence of potential impact. An initial risk rating is assessed on the basis of no or minimal environmental controls being in place. Mitigation measures are then proposed and a residual risk rating is assigned (assuming that mitigation measures are applied).

The likelihood of each impact is given as:

- Almost certain (>91%)
- Likely (61-90%)
- Possible (31-60%)
- Unlikely (6-30%)
- Rare (0-5%).

The consequence of each impact is categorized as follows:

- Very Severe (V) Effect. Likely to have very large negative impact on population or ecosystem survival or health, possible even leading to extinctions or system collapse.
- Severe (S) Effect. Likely to have severe negative impact on population, community or ecosystem survival or health.
- Moderate (M) Effect will be detectable but not severe. Populations or communities may be reduced but unlikely to lead to major changes to population, community or ecosystem survival or health.
- Low (L) Effect may be detectable but is small and very unlikely to be of significance.
- Negligible (I) Impact unlikely to be detectable.

5.2.2 Risk Rating

This generates a scoring matrix of effects as follows:

CONSEQUENCE	LIKELIHOOD				
	Rare (1)	Unlikely (2)	Possible (3)	Likely (4)	Certain (5)
Very Severe (V)	V1	V2	V3	V4	V5
Severe (S)	S1	S2	S3	S4	S5
Moderate (M)	M1	M2	M3	M4	M5
Low (L)	L1	L2	L3	L4	L5
Negligible (N)	I	I	I	I	I

5.2.3 Environmental Impact Assessment

The Environmental Impact Assessment for the Project is provided in Table 1. This present the key impacts and mitigation measures. Further management of impacts is provided in Section 6.

Table 1 Environmental Impact Assessment Register

Project Activity	Nature of Impact	Initial Risk Rating		Residual Risk Rating		Key Mitigation Measures
		Terrestrial	Aquatic	Terrestrial	Aquatic	
Earthworks	Site is erosive and erosion and sedimentation is highly likely. Local waterways are high volume, moderate velocity waterways with naturally high turbidity levels during rainfall events. Minor creeks/tributaries are more vulnerable than the major rivers to sedimentation.	M2	M3	L1	L2	Berms and overland flow diversionary drains are to direct flow to existing preferential natural flow paths. Contractor is to prepare and implement an Erosion and Sediment Control Plan (ESCP). Contractors to adhere to Environmental Management Strategies for fish movement and aquatic fauna impacts.
Fuels, oils, other hydrocarbon based substances	Spills by potential contaminants from machinery or storage. Potential contaminants used to operate machinery or stored on site include fuels, oils, etc. These materials may be spilled by accidents, which could impact soil and water quality (both groundwater and surface water). Local waterways are high volume, moderate velocity waterways with the ability to rapidly disperse fuel/hydrocarbon spills. Backwaters, eddies, minor creeks and tributaries are more vulnerable to spills than the major rivers.	M1	S2	L1	M1	Fuel, oils and other contaminants to be stored within bunded storage areas with spill capacity equal to the volume of contaminants stored. Bunded storage area to have emergency overflow to alternative recovery area. Vehicle and machinery refuelling only to occur within designated areas bunded for that purpose. No vehicle and machinery refuelling within 20 m of the high point of the bank of any watercourses. Diesel/petrol pumps for the water intake sites (if required) are to be located on hardstand and bunded areas.
Track construction (if required)	If any track construction is required to access water pumping areas within the Mossman and South Mossman River esplanades and possible drainage lines through erosive areas.	M1	M2	L1	L2	Ensure that tracks have drainage appropriate to the rainfall and surface flow of the site. Drainage is to ensure flow off tracks is directed to preferential natural flow paths. Retain the maximum amount of vegetation possible during any possible track construction to minimise soil disturbance and runoff.

Project Activity	Nature of Impact	Initial Risk Rating		Residual Risk Rating		Key Mitigation Measures
		Terrestrial	Aquatic	Terrestrial	Aquatic	
Transport, handling and storage of fuel, oils and other hazardous materials	Spillage of materials during transport to or from site, or whilst operation of escavation equipment on a floating platform via MWTP for riverbank revetment works on the Mossman River and South Mossman River, may have adverse impacts. Storage and handling of fuel on site could result in hydrocarbons & chemical spills could enter watercourses affecting aquatic invertebrates, fish, turtles & crocodiles. Extent of impact will depend on volume & nature of material & duration of spill. Major impacts would result from tanker accidents, loss of fuel from storage, floating platform accidents & refuelling or vehicle wash-down near streams.	L1	S3	L1	M2	Adhere to AS1940-2004 - the storage and handling of flammable and combustible liquids. Develop & implement emergency spill response plan. Adhere to Environmental Management Strategies for impacts to terrestrial and aquatic flora and fauna.
Land Clearing & Earthworks	Soil erosion due to exposure of soil through clearance of vegetation etc. allowing various types of erosion to occur. Sedimentation of watercourses from eroded materials (soil & vegetation). Flooding & storm-water damage. Drainage patterns can be affected by earthworks and ultimately lead to changes in water yields. Reduced water quality with consequent reduction in suitability of water for domestic use.	M2	M3	L1	L2	An ESCP will be developed. Rapid re-vegetation of sites once complete. Minimise vegetation clearance, where practicable. Berms and overland flow diversionary drains are to direct flow to existing preferential natural flow paths.
Removal of Streamside Vegetation	Removal of vegetation could have a negative impact on species of fauna that prefer or depend on this habitat.	M3	M3	M2	M2	Limit clearing of riparian vegetation where practical.

Project Activity	Nature of Impact	Initial Risk Rating		Residual Risk Rating		Key Mitigation Measures
		Terrestrial	Aquatic	Terrestrial	Aquatic	
	Lack of vegetation will increase erosion and sediment entering streams.					Prompt re-vegetation post local construction activities and allow natural regeneration of areas not required for construction.
Vegetation clearing	Potential for clearing of adjacent endangered regional ecosystems (associated with Mossman River and South Mossman River). These areas are protected and if clearing occurs legislative non-compliance will be recorded and actioned upon.	M3	M2	M1	M1	Vegetation to be cleared is to be clearly demarcated on site. Site Plan is to be used to indicate where protected vegetation and no-go zones are. If any clearing occurs in this area notify DSC immediately and stop work in this area.
Vegetation clearing	Disturbances to animal breeding places at the two sites of revetment works on the Mossman and South Mossman Rivers.	M3	M3	M2	M1	Engage a suitably qualified fauna spotter catcher to supervise all clearing works. Progress clearing activities in a manner that allows opportunities for wildlife to vacate the affected area. Retain canopy trees for harbourage where possible. Contact a local wildlife carer or RSPCA for orphaned wildlife and advices on disturbance to wildlife requiring relocation or care in the event of injury. A local vetinarian may also be consulted if required.
Use of diesel-powered Plant & Machinery	Contamination from spills or leakages of hydrocarbons (fuels etc.) & hazardous chemicals.	M1	S2	L1	M1	Adhere to AS1940-2004 - the storage and handling of flammable and combustible liquids. Fuel, oils and other contaminants to be stored within bunded storage areas with spill capacity equal to the volume of contaminants stored. Vehicle and machinery refuelling only to occur within designated areas bunded for that purpose. No vehicle and machinery refuelling within 20m of the high point of the bank of any watercourses. Diesel/petrol pumps for potential water intake sites are to be located on hardstand and bunded areas.

Project Activity	Nature of Impact	Initial Risk Rating		Residual Risk Rating		Key Mitigation Measures
		Terrestrial	Aquatic	Terrestrial	Aquatic	
Disposal of Construction Wastes	Contamination from liquid and solid wastes owing to leaching of waste disposal sites and presence of hazardous waste such as batteries, fuel/oil containers.	M1	S1	L1	M1	A waste management plan will be developed. All solid wastes will be disposed of in approved DSC landfill sites and will be dealt with according to type, i.e. inert, hazardous or organic.
Water abstraction	Depletion of water resources (groundwater, surface water).	I	L1	I	L2	Unlikely to be an issue due to constant replenishment of water resources from the high rainfall and large wetland catchment area.
Storage of chemicals, fuels or oils and container disposal	Leakages from storage area and equipment use.	L2	M2	L1	M1	Adhere to AS1940-2004 - the storage and handling of flammable and combustible liquids. All fluids to be stored in bunded and secured storage areas in accordance with the recommendation of the material safety data sheet for the substance. Hazardous substance storage containers are not to be burnt, but are disposed of in a DSC landfill site, which limits potential for leachate escaping the landfill.
Wildlife Awareness	Awareness of crocodiles or snakes to avoid injury from snake bite or crocodile attack.	I	I	I	I	Ensure a spotter is present with all works around riverbanks and on water for the presence of crocodiles or snakes. Ensure a snake bite kit is onsite for riverbank stabilisation works. Ensure Emergency Evacuation Procedures are understood and phone / 2way radio is available at all times to contact Emergency Services.

6. Environmental Management Strategies

The environmental aspects of each construction activity that require environmental management are presented as environmental management strategies, which form the individual elements of the EMP. The structure of each element is detailed below:

Policy: The guiding environmental management objectives and activities that apply to the element to establish procedures to be undertaken by Contractors.

Performance Criteria: Sets the benchmarks by which the success of the management strategies are judged.

Management Actions: The procedures to be employed to ensure that the relevant objectives are met.

Monitoring and Auditing: The process of measuring actual performance, or how well the policy has been achieved. This includes the format, timing and responsibility for inspecting and auditing of the monitoring results.

Reporting: It is the responsibility of the Project Manager to ensure environmental reporting occurs, that environmental incidents are reported promptly and that the timeframes for non-conformance corrective actions is identified.

Corrective Actions: The actions to be implemented in the case of a non-conformance.

6.1 Air Quality

6.1.1 Policy

- To prevent dust and other atmospheric emissions generated by preconstruction, construction, operation and maintenance activities from causing a hazard or nuisance on site
- To comply with the *Environmental Protection Policy (Air) 2008.*

6.1.2 Performance Criteria

- No air emission complaints.
- Reduce the greenhouse gas emissions where possible.
- Minimise land clearing where possible.
- Project maximises efficiency.

6.1.3 Construction Implementation Strategy

Management Actions:

- Fit and maintain all plant with proprietary emission control equipment.
- No on-site burning of construction wastes (including no burning of vegetation).
- Implement training for all staff to ensure all emissions are minimised.
- Ensure that vehicles and machinery are fitted with appropriate exhaust systems and devices. Such devices will be maintained in good working order, in accordance with the manufacturer's recommendations.
- Minimise vehicles and equipment left idling where safe.
- Apply dust suppressants or watering to work areas and access tracks on an as required basis to prevent dust nuisance (but ensure erosion is not promoted).
- Restrict vehicles to approved access tracks.
- Maintain stockpiles, for example stripped topsoil, in a condition that prevents windblown dust generation. This may include watering or covering of stockpiles.
- Limit bare earth exposure to that essential to the efficient and effective construction of the Project.
- Rehabilitate or allow natural regeneration of bare areas, as soon as the area is no longer required for construction.
- Where practicable, locate access tracks away from dust sensitive locations to reduce likelihood of dust nuisance or complaint.

Monitoring and Auditing:

- All site personnel will monitor condition of access tracks and work areas, and report any areas where dust nuisance is likely to occur.
- Carry out regular visual surveillance of vehicles, plant and equipment. The surveillance is to determine when actions are required to reduce potential dust nuisance.
- Quantitative monitoring may be conducted to investigate a complaint, if required by an administering authority, to determine if dust levels comply with the performance criteria specified in this EMP.

Reporting:

- All complaints to be reported immediately to Contractor Supervisor and DSC and in writing within 24 hours.
- Summary of non-compliances, corrective actions and preventative actions to be recorded and available on request.
- All complaints recorded in a complaints register for the project. The resolution of the complaint will also be recorded.
- Any material or serious environmental harm to be reported to DSC immediately.

Corrective Actions:

- Review of the implementation strategies will be carried out following any complaint to determine their adequacy, and whether additional measures need to be implemented. Where further measures need to be implemented, these will be added to this EMP.
- Corrective and preventative actions will be implemented, on an as needed basis, to address dust nuisance.

6.2 Noise and Vibration

6.2.1 Policy

- Compliance with the *Environmental Protection (Noise) Policy 2008.*

6.2.2 Performance Criteria

- No complaints or requests from DSC for noise monitoring.
- Correct implementation and maintenance of mitigation measures.

6.2.3 Construction Implementation Strategy

Management Actions:

- Permanent warning signs are to be erected to indicate the mandatory use of ear protection where required.
- Noise management within the workplace is to be in accordance with *AS/NZS 1269 Occupational Noise Management,* where applicable.
- Maintain and undertake regular maintenance of construction vehicles and equipment in order to limit noise emissions.
- Maintain noise suppression devices (such as mufflers) on construction vehicles and equipment.
- Deliver or remove materials and equipment to and from the site within the approved hours for construction. All transport vehicles will be in good working order.
- Ensure transport routes to and from the site are located, where possible, to limit the impact of traffic noise on potentially sensitive areas.
- Select construction equipment based on industry good practice.

Monitoring and Auditing:

- General auditory observations (qualitative assessments) during site activities.
- Noise assessments (quantitative) only on direction from a statutory authority. These noise assessment will be carried out, where necessary, to investigate a complaint. The noise assessment will determine if noise nuisance has occurred and will also identify measures to reduce the likelihood of further complaint.

Reporting:

- All complaints to be reported immediately and in writing within 24 hours to the Contractor Supervisor and DSC.
- Summary of complaints, non-compliances, corrective actions and preventative actions to be recorded and reported.

Corrective Actions:

- Investigate any noise complaints and implement measures, where practicable, to prevent the re-occurrence of a similar complaint. Noise measurement and monitoring may be required.
- Repair or modify defective or noisy equipment to comply with the above policy requirements.

6.3 Invasive Species and Weeds, Plant Pathogens and Pests

6.3.1 Policy

- No introduction, release, movement or transportation of pest plants, animals and diseases declared under:
  - *Biosecurity Act 2014* and
  - *Douglas Shire Council Local Laws*
- Ensure works are undertaken in accordance with Australian and international quarantine procedures.
- Reduce invasive species impact from construction activities.
- Prevent exotic weeds and plant pathogens from entering, spreading or becoming established in the project area during construction works.
- Identify, and contain, suppress or manage significant weeds and plant pathogens already in the project area to prevent spread by project activities.

6.3.2 Performance Criteria

- No new pest or disease outbreaks observed on the project area.
- Number of complaints or requests from DSC for invasive species, weed and/or pathogen issues or monitoring.
- Correct implementation and maintenance of mitigation measures.

6.3.3 Construction Implementation Strategy

Management Actions:

- Vehicles arriving at site must, prior to arriving at site, undergo vehicle checks or wash down procedures and provide evidence of a weed hygiene certificate.
- All staging areas are to be kept free of weeds (as applicable).
- Control priority weeds in construction areas.
- Implement all pest/ disease management plans.
- Limit work vehicles and machinery to designated access and work site areas, including parking of vehicles and machinery.
- Prohibit the washing of equipment, vehicles or machinery near or within watercourses.
- Avoid the use of herbicides to clear vegetation unless absolutely necessary.
- Use herbicides approved by DSC only for the eradication of a serious invasive weed, where this is considered to be the most effective form of control.
- All stockpiling is to remain weed free and regularly inspected.
- All imported fill material is to be weed free (i.e. clean).
- Ensure that water filled containers are not available for dengue mosquitos to lay eggs in by sealing all water containers. Rubbish, equipment and storage areas are to be managed to prevent pooling of water. Vehicle ruts and dense vine cover will also need to be monitored for pools of water and possible malaria mosquito larvae. Any pools of water should be drained.

Monitoring and Auditing:

- Monitoring will be conducted as outlined in the prepared management plans.
- Auditing will be conducted to ensure compliance with this EMP.

Reporting:

- Report any suspected pest or disease outbreaks to the Contractor Supervisor on site.
- Record the location of and report any new outbreaks/infestations.
- Prepare and keep records, including clean down records.

Corrective Actions:

- Repair and maintenance of any damaged/faulty equipment and/or infrastructure that has the potential to increase the likelihood of invasive species, weed or pathogen spread.
- Training of staff to ensure competency.
- Altering and issuing different site instructions about weed and pathogen associated procedures.

6.4 Cultural Heritage

6.4.1 Policy

- Compliance with the *Aboriginal Cultural Heritage Act 2003*

6.4.2 Performance Criteria

- Provide effective recognition, protection and conservation of cultural heritage.
- Avoid known cultural heritage sites (including both archaeological sites and oral tradition sites) where necessary and practicable.
- Where avoidance is not possible, manage cultural heritage sites in consultation with Australian Government and traditional landowners, in particular the Jabalbina Yalanji Aboriginal Corporation RNTBC.

6.4.3 Construction Implementation Strategy

Management Actions:

- Develop and have approved by the Department of Aboriginal and Torres Strait Islander Partnerships, Cultural Heritage Duty of Care for disturbance activities. Refer to Issues Paper Cultural Heritage Duty of Care Guidelines Review 20 April 2017. In Particular Category 2 – Activities consistent with previous land use activities and Category 3 – Activities inconsistent with previous land use activities.
- Assess Cultural Heritage Risk.
- Implement Ask First – A guide to respecting Indigenous heritage places and values released by the Australian Heritage Commission.
- Ensure significant cultural heritage findings are interpreted, documented and reported to the Department of Aboriginal and Torres Strait Islander Partnerships.
- Consult with community representatives of the Jabalbina Yalanji Aboriginal Corporation RNTBC, on matters concerning the management of cultural heritage site chance finds.
- Implement cultural awareness before work activities commence to induct personnel.
- For significant sites encountered during construction, consult with Department of Aboriginal and Torres Strait Islander Partnerships as described in the Issues Paper Cultural Heritage Duty of Care Guidelines Review.

Monitoring and Auditing:

- Periodically inspect sites to ensure cultural heritage items are not accidently being found and disturbed.

Reporting:

- Report immediately any suspected chance finds as per the Issues Paper Cultural Heritage Duty of Care Guidelines Review.
- Notify DSC Project Manager and Contractor Supervisor immediately if any sites marked for preservation are disturbed.
- Notify and liaise with Department of Aboriginal and Torres Strait Islander Partnerships and a community representatives of the Jabalbina Yalanji Aboriginal Corporation RNTBC as required.

Corrective Actions:

- Implement workforce training regarding duty of care for managing activities that may harm Aboriginal cultural heritage.

6.5 Wildlife and Habitat

6.5.1 Policy

- To minimise the impacts on wildlife that are likely to arise from the construction, operation and maintenance activities
- Compliance with the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth), the *Nature Conservation Act 1992* and *Fisheries Act 1994.*

6.5.2 Performance Criteria

- Appropriate corrective/remedial action taken in the event of a wildlife sighting during project activities.
- Number of incidents of impacts upon wildlife.
- Investigate, monitor and report wildlife interactions.
- No infringements with legislative requirements associated with wildlife.

6.5.3 Construction Implementation Strategy

Management Actions:

- Minimisation of the extent of works where possible.
- Engage a suitably qualified fauna spotter catcher to supervise all clearing works. Fauna spotter catcher is to maintain records of animal breeding places disturbed. The Contractor is to abide by all instruction from the fauna spotter catcher. The fauna spotter catcher is to identify if a Species Management Program is required.
- Retain habitat/canopy trees, ensuring the habitat/canopy trees will not impact on the safe and secure operation of the project.
- Progress clearing activities in a manner that allows opportunities for wildlife to vacate the affected area.

- Identify any areas of significance which will require specific attention (areas of sensitivity).
- Maintenance of noise inhibitors including mufflers associated with the use of noise generating equipment where possible, to avoid impact to wildlife.
- Induct all site personnel on importance of minimising impacts on native wildlife.
- Contact a local wildlife carer, RSPCA or local vet and notify Contractor Supervisor in the event of disturbance to an animal breeding site or animal injury where relocation or animal rehabilitation is required.
- Prohibit domestic pests and animals on the site during construction.
- Prohibit the dumping of rubbish in and around the construction site (use designated waste bins).
- Prevent hunting, fishing and gathering by contractors.
- Check incoming construction material on arrival at the site for invasive fauna (such as toads)
- Clearing to be undertaken in a staged and sequential manner.

Monitoring and Auditing:

- Construction activities will be monitored to ensure compliance with the requirements of this EMP and/or as frequently as deemed necessary by the applicable responsible person.
- Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP.

Reporting:

- Fauna spotter catcher reports will be prepared documenting wildlife species identified during clearing and measures deployed to minimise impacts on the identified wildlife.
- Any nest or wildlife removals to be recorded in a register (as per fauna spotter catcher and Species Management Program (if needed))
- Summary of non-compliances, corrective actions and preventative actions to be recorded and reported to DSC.

Corrective Actions:

- Corrective works for any damaged retained wildlife habitat / areas of sensitivity i.e. rehabilitation works.
- Review and amend implementation strategies if necessary.
- New wildlife discoveries will be reported to Contractor Supervisor and DSC.

6.6 Vegetation

6.6.1 Policy

- To minimise the impacts on vegetation from the construction and operation of the asset, in compliance with the *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)*, *Vegetation Management Act 1999* and *Nature Conservation Act 1992* and the *Water Act 2000.*

6.6.2 Performance Criteria

- Disturbance to flora is minimised, consistent with safe and reliable operation of the project.
- Vegetation clearing is consistent with requirements of the *Vegetation Management Act 1999.*

6.6.3 Construction Implementation Strategy

Management Actions:

- Prohibit unauthorised clearing. Vegetation to be cleared is to be clearly demarcated on site. A Site Plan is to be used to indicate where protected vegetation and no-go zones are. The key no-go zone is the protected endangered regional ecosystem vegetation near the Mossman River. If any clearing occurs in this area notify DSC immediately and stop work in this area.
- Implement protected plant exemption conditions for any work.
- Identify significant protected vegetation communities/ individuals and develop, where necessary, strategies to minimise impact on such vegetation, taking into consideration any existing recovery plans.
- Limit the extent of clearing to that for the effective and efficient construction and maintenance activities, as well as the safe and secure operation.
- Prohibit the storage, parking or movement of vehicles, plant and equipment beyond the areas approved for clearing or where they have been previously cleared.
- Temporary storage of plant and equipment is only to occur within the work area.
- Induct all site personnel, on clearing methods and vegetation marking protocols. Work areas will also be clearly defined in the induction.
- Revegetation (grassing etc.) shall be encouraged on non-work areas as required.

Monitoring and Auditing:

- Monitoring will be carried out in compliance with conditions of any approval issued under the *Sustainable Planning Act 2009*.
- Construction activities will be monitored to ensure compliance with the performance requirements as specified in the EMP or as frequently as necessary.
- Extent of clearing marked up prior to the commencement of works.
- Monitor for any unauthorised clearing works beyond the extent of clearing barriers.
- Monitoring movements of vehicles, plant and equipment onsite.

Reporting:

- Summary of non-compliances, corrective actions and preventative actions to recorded in the monthly compliance report.

Corrective Actions:

- Review and amend implementation strategies as necessary.
- Corrective actions shall be developed in consultation with DSC where any unauthorised clearing has occurred.
- Install fencing/bunting and signage to prevent re-occurrence of off access or work area movements or damage.
- New flora discoveries will be reported to the DSC immediately and appropriate management strategies for the plant discovery prepared.

6.7 Acid Sulfate Soils

6.7.1 Policy

- To minimise the risk of disturbance to ASS or PASS during riverbank revetment works of the Mossman and South Mossman Rivers (including earthworks and dewatering activities).
- Ensure compliance with requirements of the State Planning Policy and the Queensland Acid Sulfate Soil Technical Manual 2014.

6.7.2 Performance Criteria

- Oxidation of potential ASS and acid leachate generation is minimised.
- Any construction works that involve the disturbance of ASS is only to be undertaken with appropriate mitigation strategies and ASS control measures in place.
- No environmental harm associated with disturbance of ASS.
- Comply with the requirements of the State Planning Policy and relevant guidelines.

6.7.3 Construction Implementation Strategy

Management Actions:

- If suspected ASS or PASS is encountered, the Site Supervisor and Project Manager shall be notified immediately.
- Suspected ASS to be treated as either regulated waste, and/or stockpiled in a designated bunded area and neutralised in a timely manner following dry excavation. Treatment will be pending laboratory analysis.
- Confirmed ASS shall be treated in line with the Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines v4.0 (DSITIA, 2014). Adequate quantities of agricultural lime shall be available at the designated treatment site for immediate application should ASS be identified unexpectedly.
- If ASS are found a specific ASS Management Plan is to be developed and implemented.
- Dewatering shall be undertaken in a manner that minuses exposure of ASS. That is, drawdown of the water table will be minimised.

- The Contractors EMP is to detail management of dewatering.
- Minimise treatment of ASS during foreseeable or extended periods of wet weather.
- Educate workers in the identification of ASS and PASS, such that if any obvious ASS or PASS is unexpectedly encountered during excavations, it shall be identified and reported to the Site Supervisor on exposure.

Monitoring and Auditing:

- Monitoring shall be in accordance with this EMP and ASS or PASS control measures initiated (if encountered).
- Records of all monitoring results shall be maintained on site and available upon request.
- All excavations in areas are to be monitored daily by the Site Supervisor in regard to ASS or PASS.

Reporting:

- All persons on the construction site have a General Environmental Duty under the EP Act to ensure that the potential for environmental harm is minimised, and to notify the Site Supervisor or appropriate persons/authority on becoming aware of such harm occurring.
- Site Supervisor will complete an incident report.

Corrective Actions:

- Report disturbance to the relevant authority who will determine remediation on a case-by-case basis.
- If an incident constitutes serious or material environmental harm, an incident report must be forwarded to DSC immediately.

6.8 Erosion and Sediment Control

6.8.1 Policy

- Ensure erosion and sediment control are consistent with the International Erosion Control Association *Best Practice Erosion & Sediment Control Guidelines 2008* and the Environmental Protection (Water) Policy 2009.

6.8.2 Performance Criteria

- Maintenance of water quality and flow regimes.
- All sites are stable with no uncontrolled sediment leaving the work site.
- No new erosion resulting from DSC's activities within and adjacent to the project area.
- No new erosion resulting from stormwater releases from DSC's activities.
- Appropriate erosion and sediment controls in work areas.

- No complaints or reports of significant erosion or downstream sedimentation as a result of DSC's activities.

6.8.3 Construction Implementation Strategy

Management Actions:

- Contractor is to develop and implement a site specific ESCP. Erosion and sediment controls shall be designed to consider site conditions, slope, proximity to sensitive environments, receiving water quality, construction phase and climatic conditions.
- The plan may include access track sketches, benching or site work plans, establish performance and design standards for the sediment and erosion controls and show temporary and permanent erosion controls. This plan is to be provided to the contractor for implementation.
- Identify the environmental values and water quality objectives of the receiving waters.
- Incorporate progressive erosion and sediment control measures into project and construction timelines.
- Avoid placement of fill material in watercourses expect where required for the works packages.
- Avoid disturbance on areas outside the construction footprint where practical.
- Maintain surface water quality in all watercourses near the construction footprint.
- Reduce time between clearing and grading/capping of sites as far as practical to limit exposure of the site soils and subsoils to rainfall-based erosion and scour.
- Where practicable, reduce disturbance of natural drainage channels during grading, avoid blocking channels with graded material.
- Implement the requirements of the ESCP's before undertaking works on site. Install devices, when possible, prior to soil disturbance from construction activities.
- Maintain all temporary erosion control measures until the site is stabilised.
- Provide on sites where there is potential for downstream sedimentation, sediment fences, mulch berms, vegetative buffers or other sediment controls down slope of the work area. Maintain and install the controls in accordance with the *IECA Best Practice Erosion and Sediment Control Guidelines*.
- Consult with DSC prior to any modification or removal of sediment and erosion control structures, to determine alternative controls and timeframes for reinstatement.
- Divert clean stormwater runoff around the work sites in a manner that minimises soil erosion and sedimentation.
- Maintain grass cover to the maximum practicable extent. Reduce damage to grass cover by limiting vehicle movements to work areas and approved access tracks.
    - Prepare and implement a dewatering plan or work procedure.
- Limit area and duration of exposed soil to that essential for safe and efficient construction activities.
- Adequate erosion and sediment controls will be installed (both during construction and as part of reinstatement) to protect water resources.

Monitoring and Auditing:

- Monitoring shall be in accordance with this EMP and the ESCP.
- Monitoring of storm and flood warnings shall be undertaken throughout construction and contingencies will developed for such events.
- Undertake visual assessments of presence and effectiveness of erosion and sediment control structures and measures, particularly preceding significant rainfall events (within 24 hours of expected rainfall while the site is unstable; weekly inspections when rainfall is not expected or the site is stable).
- Monitor condition and capacity of sediment fences.
- Reviewing adequacy of installed erosion and sediment controls.

Reporting:

- Any water quality test results to be recorded and available when requested.
- Any EMP non-compliances to be documented and reported.
- ESCP, Rehabilitation Plans, Dewatering Plans and Site Work Plans/Benching Plans to be prepared as needed.

Corrective Actions:

- Existing erosion and sediment structures to be re-instated or repaired.
- Review of adequacy of stormwater management measures, and install additional measures were required.
- Desilt sediment control devices when the 50% capacity of the device is reached.
- Remove sediment fences when sites are stable.

6.9 Waste Management

6.9.1 Policy

- Compliance with the *Waste Reduction and Recycling Act 2011* and the *Environmental Protection Act 1994*.

6.9.2 Performance Criteria

- All waste disposed of at facilities approved by DSC.
- No detection by employees of incorrect waste disposal.
- No uncontrolled waste or litter observed on site or released to surrounding environment.
- Appropriate storage and disposal of fuels and waste evident on site.

6.9.3 Construction Implementation Strategy

Management Actions:

- Identify waste management requirements for the site, which addresses the collection, handling and disposal of waste. This should identify the opportunities to avoid, reduce, reuse and recycle waste materials. Where practical, wastes shall be segregated and reused/recycled (e.g. scrap metal and cable off cuts). The waste management plan is to also establish a preferred waste management hierarchy and develop principles for achieving good waste management in accordance with the *Waste Reduction and Recycling Act 2011* and the *Environmental Protection Act 1994.* This plan must identify waste disposal options for the onsite disposal of the various wastes identified for the construction process.
- Clearly identify collection bins as “general waste” and “recyclables”.
- Where possible vegetation cleared should be milled and used in construction. Vegetation residues are not to impact on downstream water quality.
- Refuse containers are to be used. Personal waste, including food scraps, are to be disposed of in a putrescible waste landfill.
- Collect and dispose of appropriately and regularly, all construction waste.
- Use ablution facilities/portable toilets when provided.

Monitoring and Auditing:

- Regular inspection of site facilities undertaken to ensure waste is being generated, stored, handled, disposed and transported in accordance with regulations.

Reporting:

- Summary of non-compliances, corrective actions and preventative actions to recorded in the monthly compliance report.

Corrective Actions:

- Clean up works in accordance with the Performance Criteria and Implementation Strategy sections of this EMP.

6.10 Hazardous Materials

6.10.1 Policy

- Fuel and hazardous substances stored onsite to be compliant with AS1940 – The storage and handling of flammable and combustible liquids.

6.10.2 Performance Criteria

- No contamination of land or water as a result of a spill.

6.10.3 Construction Implementation Strategy

Management Actions:

- All transfers of liquid materials must be undertaken by trained operators according to local work instructions which adequately consider prevention of spills, and spill kits must be maintained at all locations where transfer is to occur.
-
- Temporary storage facilities should be established for hazardous materials at least 50 m away from any watercourse.
- Ensure hazardous materials are stored appropriately and are prevented from draining onto the ground or into waterways.
- Transport, handle and store all oils and chemicals in accordance with the relevant AS 1940:2004 (including secure storages). Temporary bunds may include earthen bund lined with plastic sheeting or portable plastic trays.
- Prohibit the refuelling of vehicles and machinery within 20 m of the high bank of waterways or drainage lines.
- Maintain machinery in accordance with manufacturer's recommendations/servicing schedules.
- Keep Safety Data Sheets (SDS) for each chemical used on-site.
- Train all site personnel on safety and response procedures during site inductions.
- Ensure materials and equipment (viz. spill kit) required to respond to a hazardous spill are to be on site at all times when hazardous materials are being used, transported, loaded or unloaded.
- Spill kit equipment must be fit for purpose based on type of chemical/material and expected quantities. Consider the risk of spills over water (and resultant contents of spill kits).
- Store regulated waste (e.g. hydrocarbons) in appropriately sealed containers suitably marked identifying their contents. Transfer to a waste contractor licensed to receive such waste.
- All spills to water or within a protected area will be reported to DSC immediately.

Monitoring and Auditing:

- Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP.
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Reporting:

- Spill Register to be kept on site for all spills.
- SDS for all chemicals to be retained on site in a SDS register.
- All spills of chemicals or hydrocarbons on-site are to be cleaned up reported and immediately.
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Corrective Actions:

- Repair and maintenance of any damaged bunds and tanks.
- Train all staff to ensure competency.

6.11 Aquatic Ecology and Fisheries

6.11.1 Policy

- Compliance with the *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* and *Fisheries Act 1994* and the *Nature Conservation Act 1992.*
- Development Approval conditions are met.

6.11.2 Performance Criteria

- Reduce risk of adverse impacts to local fisheries and fishing communities.
- Develop ongoing monitoring program to better understand current fishing pressure, state of local fisheries and vulnerability of local communities.
- Maintain background water quality in all watercourses near the project.

6.11.3 Construction Implementation Strategy

Management Actions:

- Construction impacts to be managed according to relevant measures in this EMP.
- Possession of fishing equipment is prohibited for staff.
- Wastes are to be appropriately disposed of in accordance with Waste Management measures (Section 5.10), no waste materials are to be deposited in the surrounding watercourses.
- Ensure possible pollutant sources to the receiving environment are managed as per this EMP.
- Ensure risk of spills is managed and in the case of a spill, properly contained to minimise damage to receiving environment including fisheries and fishing communities.

Monitoring and Auditing:

- Construction activities will be monitored to ensure compliance with the requirements of this EMP and/or as frequently as deemed necessary by the applicable responsible person.
- All personnel are responsible for ensuring that their tasks are performed in accordance with this EMP.

- All monitoring and auditing is to be in accordance with the standards and guidelines mentioned in the Water Quality section of this EMP and as specific by DEC (if done so).
- Implement monitoring as specified in this EMP, ongoing monitoring of fisheries is to be carried out where feasible.
- Audits are to be conducted regularly to ensure this monitoring program is being followed correctly.

Reporting:

- All personnel are responsible for reporting to the applicable responsible person any occurrences of excessive impacts or when aquatic ecology and fisheries mitigation measures are not being complied with.
- In the event of a complaint associated with the generation of excessive aquatic ecology and fisheries impacts, a report will be prepared detailing the complaint, corrective action and further monitoring required to minimise the potential for further complaints. Copies of the reports are to be kept.
- Report results of all monitoring and record any identified exceedances in water quality from the monitoring.

Corrective Actions:

- Assist in reporting to DSC and DAF and assist in the implementation of fisheries management measures where necessary.
- Repair and maintenance of any damaged equipment/infrastructure that could cause water quality pollution.
- Train all staff to ensure competency.

6.12 Water Quality

6.12.1 Policy

- To be compliant with *the Environmental Protection Policy (Water) 2009* and sediment control measures to comply with best practice guidelines as outline in *Best Practice Erosion and Sediment Control, IECA (2008).*

6.12.2 Performance Criteria

- Reduce the impact on water quality (and associated beneficial values, which includes use as drinking water and aquatic ecosystem protection) arising from project activities.
- Reduce the impact on existing surface water flow regimes and groundwater aquifers (and associated beneficial values, which includes use as drinking water and aquatic ecosystem protection) arising from project activities.

6.12.3 Construction Implementation Strategy

Management Actions:

- Construction stormwater runoff shall have no visible oil sheens.
- Stream bank reinstatement to commence as soon as in-stream construction work is completed, where applicable.
- Treat all water and wastewater discharges as necessary to comply with DSC's requirement, and develop a contingency plan outlining actions to be taken should it become apparent that the quality criteria may not be met.
- If water abstraction is undertaken, conduct environmental assessments at surface water abstraction sites to confirm project water abstraction requirements do not impact on downstream users or environmental flows.
- Water taken from watercourses or groundwater will meet DSC's requirement.
- Ensure that settling ponds and retention basins are designed to a standard to account for climatic conditions.
- Implement a water quality monitoring within the project area and nearby affected vicinity.

Monitoring and Auditing:

- Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP.
- Carry out monthly inspection of contractor's records and registers to ensure compliance with the requirements of the EMP.

Reporting:

- Results of all monitoring.
- Report and record any identified exceedances from the monitoring.

Corrective Actions:

- Repair and maintenance of any damaged/faulty equipment and/or infrastructure that has the potential to increase the likelihood of adverse impacts.
- Train all staff to ensure competency.
- Altering and issuing different site instructions to lessen the likelihood of adverse impacts to nearby watercourses.

GHD

1st Floor 85 Spence Street Cairns QLD 4870
PO Box 819 Cairns QLD 4870 Australia
T: 07 4044 2222 F: 07 4044 2288 E: cnsmail@ghd.com.au

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	K Cauchi	A Smedley	*AS**	I Brown	*IB**	16/06/2017

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1st Floor 85 Spence Street Cairns QLD 4870
PO Box 819 Cairns QLD 4870 Australia
T: 07 4044 2222 F: 07 4044 2288 E: cnsmail@ghd.com.au

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0	K Cauchi	A Smedley	*AS**	I Brown	*IB8*	16/06/2017

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