Preliminary Erosion and Sediment Control Plan

Tully Battery Energy Storage System (BESS) Project

Prepared for: RWE Renewables Australia Pty Ltd

Date: 18/12/2025

Document information

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			Name/position	Signature
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Contents

Appendices

Figures

Tables

1. Introduction

1.1 Background

RWE Renewables Australia Pty Ltd (RWE) are seeking to develop the proposed Tully Battery Energy Storage System (BESS) (the Project) across a 27 hectare (ha) site (the Site), consisting of two freehold parcels, Lot 1 on RP735276 and Lot 1 on RP852238. The Site is located approximately 4 km south-west of the township of Tully in far north Queensland within the Cassowary Coast Regional Council (CCRC) Local Government Area (LGA).

The Project will have a capacity of up to 200 MW / 800 MWh and is proposed to take electricity from the grid in periods of low demand, and feed back into the grid at periods of high demand. Grid connection is proposed via the neighbouring Powerlink 132 kV Tully substation, located to the northeast on Lot 1 on RP716718.

Attexo Group Pty Ltd (Attexo) has been engaged by RWE to prepare this Preliminary Erosion and Sediment Control Plan (PESCP) for the Project.

1.2 Purpose and Objectives

This PESCP has been developed to support the development application for a Material Change of Use (MCU) under the Planning Act and CCRC Planning Scheme. The water management outcome identified by the CCRC Planning Scheme for healthy waters is as follows:

- Development avoids creating additional run-off into waterways and wetlands that causes pollution, erosion, channel widening and sedimentation.

This P-ESCP is intended to demonstrate that potential erosion and sedimentation impacts associated with Project establishment can be effectively managed. Further, this P-ESCP establishes the baseline standard for soil ESC applicable to Project construction works.

The overall objective of this PESCP, and all ESC for the Project, is as follows:

- *To take all reasonable and practicable measures to minimise short and long-term soil erosion and adverse effects of sediment transport* (International Erosion Control Association ([IECA] 2025, p2.1).

1.3 Scope

The best practice erosion and sediment control (BPESC) standard developed by the IECA for the Australasian region (IECA, 2025) recognises that effective erosion and sediment control requires an iterative process of plan-implement-monitor-update. A hierarchical ESC management framework has been adopted for Project construction, consisting of this PESCP developed by RWE, which is to be implemented via iterative construction ESCPs developed and maintained by the Principal Construction Contractor.

A thorough justification for this approach is provided in **Section 4.1** of this PESCP.

This PESCP applies to all Project construction activities and includes:

- A description of the Project Site and construction works required for Project establishment.
- A description of the site environmental conditions relevant to ESC planning.
- An assessment of the Project erosion risk.
- Identification of site constraints, values and potential threats.
- A description of the erosion, drainage and sediment controls to be implemented for the Project.
- Definition of the ESC monitoring and maintenance activities that will be undertaken during Project construction.
- Identification of potential ESC failures and corrective actions to be taken should these be realised.

1.4 Legislation and Standards

A summary of the legislation and standards relevant to ESC that apply to the Project is provided in **Table 1.1**. Further information pertaining to water quality objectives and targets established for the Project catchment area is provided in **Section 3.8** of this PESCP.

Table 1.1: ESC legislation and standards

Standard	Application	Administrator
The Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018	Now an online platform, the guidelines establish a broad set of physical and chemical water quality standards stressing the need to develop locally relevant guidelines. Provides a basis for which local standards can be developed and a guideline which can be used in the absence of the former.	Australian and New Zealand Governments (ANZG)
Environmental Protection Act 1994 (EP Act)	Environmental protection, establishes a General Environmental Duty (GED) and specifically addresses the release of water contaminants (S440ZG).	QLD Department of Environment, Technology, Science and Innovation (DETSI)
Environmental Protection Regulation 2019	Prescribes various matters pertaining to the EP Act, e.g. water contaminants (Schedule 10) including sediment.	DETSI
Environmental Protection (Water and Wetland Biodiversity) Policy 2019	Intended to achieve the object of the EP Act in relation to waters and wetlands. Identifies environmental values and management goals for waters, states water quality guidelines and objectives and provides a framework for decision making and monitoring and reporting on the condition of waters.	DETSI
Tully River, Murray River and Hinchinbrook Island Basins Environmental Values and Water Quality Objectives	Made under the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*. Identifies water quality objectives for surface and groundwaters of the Tully River, Murray River and Hinchinbrook Island Basins and adjacent coastal waters.	DETSI
The Planning Act 2016, subsidiary legislation, State Codes	Establishes the regulatory processes for wind farm Project approvals and criteria (including those relating to water quality impacts) against which Projects are assessed.	Department of State Development, Infrastructure and Planning (DSDIP)
Cassowary Coast Regional Council Planning Scheme 2015 (Version 4)	Planning schemes identify strategic and specific outcomes relating to water quality protection applicable to developments which are assessable under the Planning scheme.	Cassowary Coast Regional Council
IECA Australasia Best Practice Erosion and Sediment Control Guidelines 2025	Erosion and sediment control standard applicable to the development.	IECA Australasia
Reef 2050 Water Quality Improvement Plan (WQIP)	Identifies management and monitoring requirements for land-based pollution to improve the quality of water discharged from GBR catchments to the Reef. Establishes Water quality targets for each catchment that drains to the GBR.	Queensland and Australian Governments (partnership)

2. Project Description

2.1 Site Overview

The Project includes a proposed BESS with a capacity up to 200 MW / 800 MWh and associated infrastructure (e.g. transformer, OHTL, air insulated switchgear, access roads, laydown areas, foundations, hard stand, parking, switch rooms and storage). The BESS and associated infrastructure will comprise a total development footprint of approximately 9 ha within the 28.7 ha Project Site.

A summary of the terms used to describe the Project is provided in **Table 2.1**. A map showing the Site and Development Footprint is provided in **Figure 2.1**.

Table 2.1: Project descriptions

Area	Definition	Size (hectares, ha)
Project Site	Encompasses the entirety of the two land parcels (Lot 1 on RP735276 and Lot 1 on RP852238) intersected by the Project.	28.694
Grid Connection	Refers to the proposed OHTL that crosses the Project Site and ties-in to the existing Powerlink Tully substation within Lot 1 on RP716718.	
Development Footprint	Comprises the maximum area to be disturbed by the Project for the construction of the BESS. There is expected to be only limited earthworks for the Overhead Transmission Line (OHTL) connecting the BESS to the substation northeast of the Site.	9

2.2 Built Form and Concept Design

The Project has been designed to minimise impacts, in keeping with the sustainable nature of the development for supporting renewable energy projects and reducing greenhouse gas emissions. Accordingly, the existing environment; existing land use at the Site and the surrounding locality; proximity to existing electricity infrastructure; stormwater management; and noise impact have all been considered in the design development.

The primary components of the Project will consist of the following:

- Battery units will cover a total area of approximately 2.5 ha. The foundations on which the proposed battery units will likely be installed on screw piles, piers or concrete pad formations. The BESS will be connected to the adjacent switch rooms via underground cables. Inverters may be incorporated as part of the battery units or there may be separate Power Conversion Units (PCU) that convert the DC energy from the battery units.
- Stormwater drainage systems will be constructed to allow for safe collection and diversion of rainwater at the BESS facility and will be established for both construction and operational phases.
- Access to the facility will be via the existing local road network with upgraded access proposed from Sandy Creek Road.
- Grid connection will be via an overhead transmission line running from the north of the BESS area to substation on the adjoining lot.
- The BESS area will be fenced for safety and security purposes.
- An Asset Protection Zone (APZ) will be established and maintained around the battery storage infrastructure to ensure protection from bushfire and to allow access to firefighting personnel in the event of fire.
- A perimeter road will be provided for operations, maintenance and emergency response.
- Earthworks, including batters and clearing required for access to undertake civil works.

- An acoustic wall of 6 m in height has been included with the design, this is located directly on the northern perimeter of the BESS units. Subject to further design enhancements of the BESS units to reduce noise emissions, the acoustic wall may not be required.

2.2.1 Battery Energy Storage System

The battery units will cover an area of approximately 2.5 ha and will include up to 188 battery units, associated infrastructure, inverters, MV transformers, internal access roads, hardstand and security fencing.

The battery units and MV transformers would be installed on concrete footings or screw piles. Each battery unit is anticipated to weigh approximately 39 tonnes and be 8.6 m in length, 2.8 m in height and 2.1 m wide. Most battery units are approximately in the form of a 12.2 m shipping container.

The associated transformers/inverters (up to 47 units are estimated, subject to final equipment selection and design) would similarly be trucked to Site and arranged onto footings or screw piles via mobile crane.

2.2.2 Switching Station

A switching station is proposed comprising a 132/33 kV high-voltage transformer, air insulated switchgear, an auxiliary transformer, two 33 kV switch rooms and potentially harmonic filters. The switch rooms will include the switchgear and a Site office, with trenches and conduits for the cabling entering the building. The building would be manufactured off-site and delivered via truck. The switch rooms and transformers would sit on concrete footings or piles.

2.2.3 Grid Connection

The connection to the grid will be via overhead line to connect the BESS to the neighbouring 132 kV Tully Substation. The route will travel north through Lot 1 on RP735276 and connect to the neighbouring substation site on Lot 1 on RP716718.

2.2.4 Operation and Maintenance Area

A temporary construction and permanent operations and maintenance (O&M) area will be established adjacent to Sandy Creek Road. This would include an operations and maintenance building, yard, parking areas and any required office buildings, water tanks or storage sheds. Repurposing of the existing dwellings on Site as O&M areas for operation is being considered.

2.2.5 Parking and Access

Access to the facility will be via the existing road network, with two upgraded site access points to be constructed from Sandy Creek Road. The proposed access points to the development from the road network are illustrated on the Project concept design. Sufficient parking to meet the needs of the development will be provided at the Project Site.

2.2.6 Fencing

Temporary fencing will be erected at the Site once the main earthworks have been completed. Final perimeter fencing will be erected around the BESS area, switching station and O&M area for safety and security reasons.

2.2.7 Landscaping buffer

A landscape buffer of 5 m depth is proposed along the frontage of Lot 1 on RP852238. This has been designed and will be planted in accordance with the CCRC Planning Scheme requirements.

Project Area
Development Footprint
Proposed Transmission Line Corridor
Proposed transmission line
20m exclusion zone
Watercourse
Lot Parcel
Main Road
Local Road

TULLY BESS P-ESCP
Project Layout

Figure 2.2

N

0 m 100

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REVIEWED: HS **DRAWN:** KB **SCALE** 1:3,500 **DATE:** 19/09/2025 **DWG No:** RWE-002_003[C]

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Data Source:© State of Queensland (Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development) 2025, © OpenStreetMap contributors, © State of Queensland (Department of Resources) 2023, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, © State of Queensland (Department of Resources) 2024, Esri, CGIAR, Maxar

2.3 Construction Works

Construction of the BESS is estimated to be undertaken over an 18-month period, subject to final equipment selection, construction methodology and appointment of construction contractors(s). A summary of the main construction stages is provided in **Table 2.2.** Construction stages may occur in parallel with different activities taking place on different parts of the Site at the same time.

Table 2.2: Construction stages

Stage		Overview
1	Site preparation	Vegetation clearing Prior to construction works commencing, vegetation within the development footprint would be removed. The clearing methodology has not yet been determined, however, clearing will likely be undertaken through mechanical methods that are suitable for the applicable environmental conditions. The types of machinery will be determined prior to construction by the relevant contractor.
		Existing infrastructure The existing dwellings and sheds on Site will be assessed for suitability to be repurposed as O&M areas for Project operation. Where existing structures cannot be repurposed, they will be removed.
		Earthworks Civil works will be required to prepare the Project Site for construction of the BESS and ancillary facilities. Excavation and filling will be required to make the Site level and cater to stormwater management requirements. Cut and fill volumes and batter design will be finalised during detailed design.
2	Construction	BESS Bench If relevant, topsoil will be removed and stockpiled on Site for use in landscaping and rehabilitation once construction is completed or else disposed of. Where the quality of material is acceptable, excavated material would be used as backfill and compacted during the civil works program. Gravel sheeting will be applied to the BESS bench area.
		Access Roads New internal access roads will be constructed for delivery of equipment and material and ongoing maintenance activities. The access roads would be up to 6 m wide and connect the BESS compound entrance to the Site frontage at Sandy Creek Road. Any topsoil would be removed for use elsewhere where applicable, and the access roads will be finished with compacted gravel. A bitumen crossover will be constructed in accordance with the appropriate standards between Sandy Creek Road and the property boundary.
		Battery Units The battery units and MV transformers would be installed on concrete footings or screw piles. Each BESS unit is expected to be 8.6 m in length, 2.8 m in height and 2.1 m wide. The battery units would be transported to Site via heavy vehicles and craned onto their concrete footings for anchoring. The associated transformers would also be trucked to Site and arranged onto footings via mobile crane.
		Storage and Operation Area

		Areas will be designated on-site for the storage of materials in open air laydown, for use as required during operations. Switchgear Control Room A switchgear control room will be manufactured off-site and delivered to the BESS bench via trucks. The control building would sit on suitable concrete footings with trenches and conduits for the cabling entering the building. Perimeter Fencing Fencing will be erected at the perimeter of the BESS area, switching station and O&M area for safety and security reasons. Underground cabling Underground cabling within the BESS bench would be installed via open trenching, undertaken in accordance with relevant Australian Standards and marked accordingly. Upon installation of the cable, the trench will be backfilled with excavated material and the surface rehabilitated. APZ The APZ will be established and maintained around the site to a width of 48.1 m along the northern and eastern sides and 10 m along the western and southern sides. The APZ will be cleared of any vegetation and have a mineral earth or grass surface. Where a grass surface is chosen, it must be maintained at a height ≤ 10 cm during the fire danger season. Demobilisation Following completion of construction, all construction equipment will be demobilised from the Site.
3	Rehabilitation	Rehabilitation would occur in stages throughout the construction program. Rehabilitation works comprising compaction and surfacing of the BESS bench area would occur once civil works have been completed. Further rehabilitation of the Site, including disposal of waste materials (at an appropriately licensed waste facility) would occur once equipment installation and construction has been completed.
4	Operation	The BESS will be in operation 24 hours a day, every day of the year. O&M activities may occasionally extend beyond daylight hours for corrective maintenance activities as required. The Site will be remotely monitored 24 hours a day.
5	Decommissioning	The Project is intended to operate for a period of 20 years. Following this period a determination will be made whether to: Extend the life of the existing infrastructure with increased maintenance, refurbishment and/or replacement of certain components; or Repower the Site with new infrastructure; or Decommission the infrastructure and rehabilitate the Site.

2.3.1 Hours of Construction

Most construction work, including trenching and deliveries, will be undertaken during standard construction hours: Monday to Saturday, 6:30am to 6:30pm.

The following construction activities may be undertaken outside of standard construction hours:

- Distribution of materials within the Site;
- Commissioning and testing activities; and

- Other quiet works including survey work, office work and general mechanical assembly.

2.3.2 Construction Traffic

Maximum traffic generation is expected to be 40 light vehicles and 30 heavy vehicles travelling to and from the Site each day, with an average of 30 light vehicle movements daily and 15 heavy vehicle movements daily.

Given the remote location and size of the Project, it is anticipated that there is sufficient area for informal car parking spaces. As such, no formal car parking is proposed for the construction workforce and a temporary construction parking area will be designated on-site.

The construction workforce is expected to commute to site using private vehicles as no existing active or public transport networks are accessible within the Project's vicinity.

2.3.3 Construction Period

Construction of the Project is anticipated to begin in 2027 and is expected to extend for approximately 18 months.

3. Site Environmental Context

3.1 Climate

The climate of the Site is tropical and characterised by hot humid summers and summer dominant rainfall (BoM, 2025).

The dominant climate factor influencing soil erosion is rainfall. Further discussion of site rainfall is provided in **Section 3.9** in the context of an erosion risk assessment for the Site. A discussion of future climate change scenarios and how these may affect soil erosion is provided in **Section 3.9.4**.

3.2 Land Use

The Site consists of two lots (Lot 1 on RP735276 and Lot 1 on RP852238) that are both zoned as Rural under the CCRC planning scheme and currently used for livestock grazing.

Both lots are currently used as rural residential properties and are largely undeveloped. Lot 1 on RP852238 contains the Powerlink OHTL and infrastructure designation. The existing Powerlink 132 kV substation and 275 kV substation are located on adjacent lots to the north-east of the Site. Land to the south and east of the Site comprise rural areas used for sugar cane farming.

3.3 Soils

Soils within the Site have been mapped in the 1:50,000 *Soils of the Cardwell-Tully Area, North Queensland* by Cannon *et al*. (1992). The Cannon *et al.* (1992) mapping identifies two mapped soil units (Hewitt and MSC) over the Site as shown in **Figure 3.1** and detailed in **Table 3.1**. The Development Footprint is located entirely within the area mapped as comprising Hewitt soils.

The Hewitt soil series forms a continuum, becoming progressively more poorly drained with distance from higher, better drained levees. Overall, the Hewitt soil unit is mapped as containing poorly drained soils formed on alluvium. MSC is a miscellaneous map unit that has not been assessed in detail, located in the north of the Site.

Table 3.1: Soils (Cannon et al, 1992) mapped within the Site

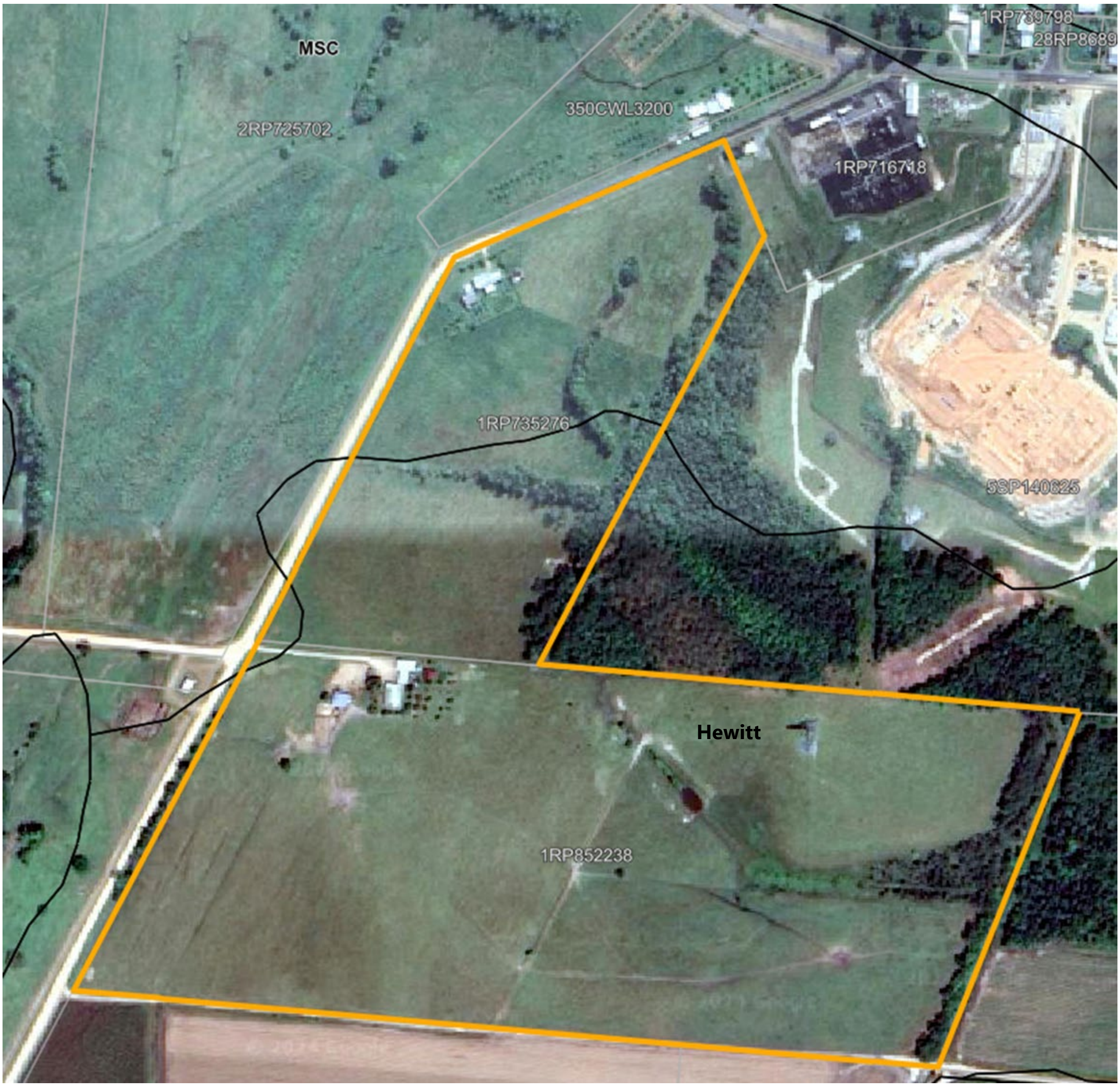
Soil	Landform	Major distinguishing features	Australian Soil Classification
Hewitt	Floodplain and swamps	Sapric loamy A horizon, grey whole coloured or mottled, silty clay B horizons	Hydrosols
MSC	-	Miscellaneous type of mapping unit, used to identify areas not typically assessed in detail.	Podosols

The Hewitt soil series is described as having variable topsoil depths, from 9–80 cm thick, consisting of black to dark grey, sapric to fibric loams to clay loams. The terms sapric and fibric refer to peat materials, where fibric is undecomposed or weakly decomposed organic materials whilst sapric is strongly to completely decomposed organic material. Hewitt subsoils comprise brown to grey, clay loam to medium clays with mottling due to their commonly waterlogged status.

No soil sodicity was identified in the recorded analytical data, however soil pH is consistently acidic (<5.0) throughout the profile, with high presence of hydrogen and aluminium cations.

Due to the lack of information on the MSC soil, relevant to the proposed grid connection route north of the development footprint, it has been conservatively assumed that sodic, dispersive soils could potentially be disturbed by the Project.

Figure 3.1: The 1:50,000 *Soils of the Cardwell-Tully Area, North Queensland*



3.4 Geology

The Site is located entirely on the Qa-QLD surface geological unit, consisting of quaternary alluvium of clay, silt, sand and gravel; flood-plain alluvium (DNRMMRRD, 2025).

3.5 Topography

The Site is located south of the Tully Gorge National Park, located 4 km south of Mount Tyson. Elevation within the Site ranges from 18 m Australian height datum (AHD) in the northwest in association with a crest of 19 mAHD to the north of Sandy Creek Road, to a low of 9 mAHD in the east of the site associated with wetlands.

Topography across the site can be divided into three areas:

- The northern half of lot 1RP735276 slopes to the southeast from 18 mAHD to 10 mAHD at approximately 3–5%.
- The eastern half of lot 1RP852238 is bisected into two north-south rises at 12 mAHD by a drainage feature flowing to the southeast to the low of the wetlands at 9 mAHD.
- The southern half of lot 1RP735276 and western half of lot 1RP852238, including the development footprint, is located on land around 12 mAHD which predominantly slopes away from the north at 0.5–1.5%.

A detailed representation of site terrain using slope data from a 5 m digital elevation model from Lidar data[1] is provided in **Figure 3.2.**

[1] Digital Elevation Model (DEM) 5 Metre Grid of Australia derived from LiDAR (Commonwealth of Australia (Geoscience Australia) 2015)

Project Area
Development Footprint
Proposed Transmission Line Corridor
Proposed transmission line
20m exclusion zone
Contours (1m)
Watercourse
Main Road
Local Road
Lot Parcel
Drainage basins
MSES high ecological significance wetlands

TULLY BESS P-ESCP
Site topography and hydrology

Figure 3.2

N
0 m 100

Attexo

REVIEWED: HS **DRAWN:** KB **SCALE** 1:3,500 **DATE:** 30/06/2025 **DWG No:** RWE-002_004[B]

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3.6 Vegetation

The Site is predominantly cleared, with some remnant vegetation occurring in association with drainage features and wetlands.

Field surveys were conducted by Attexo (2025) to assess vegetation within the Site to produce a ground-truthed RE (GTRE) map to validate the mapped vegetation. The vast majority of the Site is represented by non-remnant, cleared pasture, dominated by exotic grasses. There are small areas of regrowth vegetation along the eastern boundaries of each of the Lots within the Site, with none identified within the development footprint (Attexo, 2025).

The Development Footprint is not within any mapped regulated vegetation in the Queensland Regulated Vegetation mapping nor was there any native vegetation ground-truthed within the Development Footprint (Attexo, 2025).

3.7 Protected Areas

No protected areas are present in the Development Footprint or are expected to be disturbed by the Project.

Protected areas in proximity to the Site include:

- Wet Tropics World Heritage Area: located approximately 2 km to the north and approximately 5 km to the east.
- The Great Barrier Reef World Heritage area: reaches up the Tully River to approximately 8.5 km southeast of the Site
- Great Barrier Reef Marine Park (GBRMP): approximately 17 km to the east of the Project, at the coastline.
- Tully Gorge National Park: approximately 1 km north of the Site.
- Gulngay National Park: approximately 13.5 km east-southeast of the Site downstream along the Tully River.

3.8 Hydrology and Drainage

The Site is located within the Tully River basin. Site drainage is generally in a easterly direction. The Site is intersected by three minor watercourses (stream order 1); two ephemeral waterways in the north of the site and one intermittent watercourse which runs west-east across the northern section of the Site, into the neighbouring Powerlink Queensland property and then re-entering the Site in the southwest.

There are no watercourses defined by the *Water Act 2000* (Water Act) present within the Site. An unnamed tributary of the Tully River (Sandy Creek) in the form of a constructed drain is located adjacent to the Site southeast boundary, flowing to the Tully River approximately 4 km to the south-southeast. A number of man-made farm dams occur throughout the Site associated with drainage features.

A map showing the Project location with respect catchment boundaries and local waterways is provided in **Figure 3.2**.

3.8.1 Wetlands

There are no nationally or internationally important wetlands within the Site. A wetland of high ecological significance (with associated Great Barrier Reef wetland protection trigger areas) is mapped within the Site on the Matters of state environmental significance (MSES) high ecological significance wetlands (DES, 2021), and both CRCC Planning Scheme Environmental Significance Overlay and the Waterway Corridors and Wetlands Overlay. This MSES high ecological significance wetland is mapped along the northeastern and southeastern boundary of the Site (totalling 2.3 ha within the Site), continuing into the neighbouring properties.

MSES wetland values (regulated vegetation defined watercourse) are also associated with a stream order 1 drainage feature mapped as running west-east across the northern section of the Site, into the neighbouring property and then re-entering the Site in the southwest. This water feature is listed as "unmapped" under the Water Act.

By design all parts of the Development Footprint avoid these mapped wetland values.

3.8.2 Great Barrier Reef

The Project is situated within the Tully River Catchment of the Great Barrier Reef Catchment Area (GBRCA), within the Wet Tropics resource management region. Overland flows from the Tully River Catchment discharge to the Great Barrier Reef (GBR) approximately 17 km east-southeast of the Project at Tully Heads.

Discharges of land-based pollution to the GBR are managed via the Reef 2050 WQIP in a joint initiative by the Australian and Queensland Governments. Primary pollutants of concern to the GBR from mainland sources are identified as nutrients (nitrogen and phosphorus), fine sediments and pesticides which are largely attributed to agricultural sources. Water quality targets set by the Reef 2050 WQIP for the Wet Tropics Region and Tully River catchment are outlined in **Table 3.2**, with shading indicating the management priority attributed to parameters for the Tully River Catchment.

Table 3.2: Reef 2050 WQIP end of catchment anthropogenic 2025 water quality targets

Area	Dissolved Inorganic Nitrogen		Fine Sediment		Particulate Phosphorus		Particulate Nitrogen		Pesticides
	tonnes	reduction	kilotonnes	reduction	tonnes	reduction	tonnes	reduction	target
Wet Tropics Region	1700[2]	60%	240	25%	360	30%	850	25%	To protect at least 99% of aquatic species at the end-of-catchment.
Tully River Catchment[3]	190	50%	17	20%	23	20%	68	20%	

Sediment and nutrient discharges from GBR catchments are monitored and modelled as part of the Paddock to Reef Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef Program), which provides a framework for evaluating and reporting progress towards the Reef 2050 WQIP water quality targets.

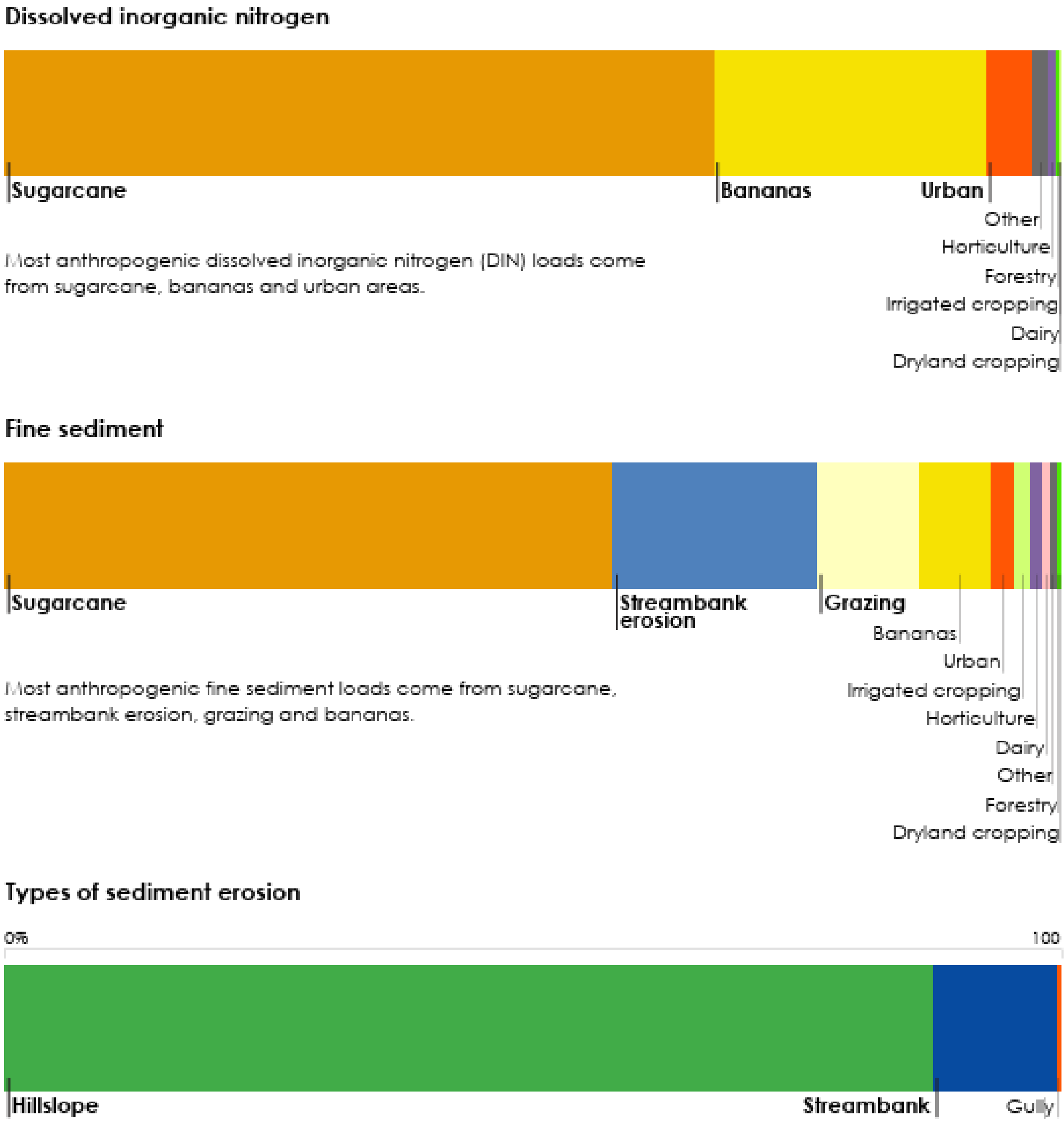
3.8.2.1 Modelled water quality pollutants

The source of sediment entering the GBR lagoon can be described based on land use, and from a physical source such as gullies, hillslopes or alluvium. Modelled water quality pollutant loads for the Tully River catchment, based on land use, are shown in **Figure 3.3** (DETSI, 2024).

It is noted that the Tully catchment contributes high loads of anthropogenic dissolved inorganic nitrogen and smaller loads of fine sediment. Most anthropogenic dissolved inorganic nitrogen (DIN) loads come from sugarcane, bananas and urban areas. Fine sediment in the catchment is predominantly derived from sugarcane, streambank erosion and grazing. The main land usage in the catchment is nature conservation (73%), followed by sugarcane (11%) and grazing (5%) (DETSI, 2024).

[2] MCL = Maintain Current Level
[3] Values represent end of catchment targets, colour highlighting of target denotes management priorities of low for green, moderate for yellow and high for orange.

Figure 3.3: Reef 2050 WQIP modelled water quality pollutant loads



3.8.2.2 Land Management Focus

Land and catchment management and adoption of minimum standards of agricultural practice is a key component of achieving the water quality targets in the Reef 2050 WQIP. The Paddock to Reef program evaluates management practice adoption and effectiveness, catchment condition, pollutant runoff and marine condition. The program has developed regional specific management practice frameworks (water quality risk frameworks) where practices are ranked from those that have the lowest water quality risk to those that have the highest risk. The 'Grazing Water Quality Risk Framework 2017-2022' in conjunction with an understanding and characteristics of the land has been used to identify land management practices for the project that minimise water quality risks.

An overview of the land management practices to be adopted by the Project to align with the Reef 2050 WQIP for high management priority pollutants (**Table 3.2**) is provided in **Table 3.3**.

Table 3.3: Project action for consistency with Reef 2050 WQIP – primary pollutants of concern

Primary pollutant of concern	Finding / Justification
Fine sediment and particulate nutrients	**Consistent with Reef 2050 WQIP** • Project ESC will meet or exceed best practice standards (IECA 2025). • Vegetation clearing and ground disturbance during construction will be minimised. • The Project will establish and maintain high levels of groundcover consistent with IECA 2025 as described in **Table 4.2** of this PESCP. • Ground disturbance outside of hardstand areas will be stabilised with vegetative (or other, e.g. rock) groundcover of a minimum >80% cover upon completion of construction. • The Project will not use fertilisers unless identified as required for revegetation. • Upon completion of construction, the Site will be maintained as grass and RWE intend to continue livestock grazing to manage fuel loads or other appropriate fuel load management strategies. RWE's operations team will manage the areas to maintain cover >90% throughout the year. • The Project will fence the wetlands to exclude livestock if grazing is used to manage fuel loads to improve water quality. • Areas of erosion near the dams on Lot 1 on RP852238 will be stabilised and cover re-established to prevent continued erosion.
Pesticides	**Consistent with Reef 2050 WQIP** • Pesticide use for the Project will be minimised by: – The adoption of preventative weed control methods e.g. vehicle and equipment hygiene. – Progressive revegetation of disturbed areas to prevent proliferation of pioneer weed species requiring chemical treatment. – Prioritisation of mechanical and manual weed control methods over herbicide application. – Regular monitoring and early response to weeds identified. – Targeted use of pesticides to minimise spray drift and prevent overuse in accordance with the Project EMP.

Land management targets identified by the Reef 2050 WQIP aim to increase the overall area of land managed using best management practices for water quality outcomes. An overview of the land management practices to be adopted by the Project to align with Reef 2050 WQIP land management targets is provided in **Table 3.4**.

Table 3.4: Project consistency with Reef 2050 WQIP – land management targets

Management Target	Determination / Justification
90% of agricultural land in priority areas managed using best management practice for water quality outcomes	**Consistent with Reef 2050 WQIP** • Grazing within the Project Development Footprint will cease, with ESCs implemented in accordance with the IECA 2025 best practice management standard. • Upon completion of construction, the Site will be managed by RWE and cover will be maintained to prevent erosion. • The Project will fence the wetlands to exclude livestock if grazing is used to manage fuel loads to improve water quality.

Management Target	Determination / Justification
	• Areas of erosion near the dams on Lot 1 on RP852238 will be stabilised and ground cover re-established to prevent continued erosion.
90% of grazing lands with greater than 70% groundcover in the late dry season	**Consistent with Reef 2050 WQIP** • A minimum of 80% groundcover will be established across Project Development footprint upon completion of construction. • IECA 2025 clearing ahead and land stabilisation timeframes (**Table 4.2**) will be abided during construction. • Upon completion of construction, the Site will be maintained as grass and RWE intend to continue livestock grazing to manage fuel loads or other appropriate fuel load management strategies. RWE's operations team will manage the areas to maintain cover >90% throughout the year.
Increase riparian vegetation	**Consistent with Reef 2050 WQIP** • The overhead transmission line may require some clearing of vegetation on the northern boundary of the Site, however this clearing will be minimised as much as possible. • The Project is committed to establishing buffers around wetlands and this is likely to result in an increase in riparian vegetation.
No loss of natural wetlands	**Consistent with Reef 2050 WQIP** • The Project will not result in the loss of any natural wetlands and will establish wetland protection buffers to prevent any potential impacts.
Improved management of urban, industrial and public land uses.	**Not applicable** • The Site does not intersect urban, industrial or public land uses.

3.8.3 Environmental Protection (Water and Wetland Biodiversity) Policy 2009

The Environmental Protection (Water and Wetland Biodiversity) Policy 2009 (EPP [Water and Wetland Biodiversity]) is intended to achieve the object of the EP Act in relation to waters and wetlands, protecting the water environment whilst allowing for ecologically sustainable development.

Under the EPP (Water and Wetland Biodiversity), environmental values (EVs) and water quality objectives (WQOs) are determined for Queensland waters, defining the use of the water and objectives for physical, chemical and biological water characteristics.

The Project is located within the Tully River basins of the broader Tully River, Murray River and Hinchinbrook Island Basins of the Wet Tropics Basins (**Figure 3.2**). Thus, WQOs for the Site are provided by the *Tully River, Murray River and Hinchinbrook Island Basins Environmental Values and Water Quality Objectives basins 113, 114, 115 and adjacent coastal waters* (Department of Environment and Science [now DETSI], 2020), made under the EPP (Water and Wetland Biodiversity).

WQOs established for the Tully River basin waters to protect aquatic ecosystem environmental value[4] under baseflow conditions are shown in **Table 3.5**. The management intent / level of protection for these waters is defined as moderately disturbed (MD)[5].

Note: WQOs are not individual point source emission objectives but the receiving water WQOs.

[4] The aquatic ecosystem EV is a default applying to all Queensland waters, and therefore the WQOs for aquatic ecosystems form the minimum WQOs for all waters. Where no human use EVs are identified, the WQOs identified for aquatic ecosystem protection remain applicable.
[5] As identified on the WQ1131 – Tully River basin, Environmental Protection (Water) Policy 2009 Wet Tropics Map series, accessed online 11.06.2025 at: https://environment.desi.qld.gov.au/management/water/policy/wet-tropics

Table 3.5: EPP (Water and Wetland Biodiversity) aquatic ecosystem WQOs for MD Tully River basin waters

Sub-basin	Amm N (µg/L)	Oxid N (µg/L)	Total N (µg/L)	FRP (µg/L)	Total P (µg/L)	Chl-a (µg/L)	DO (% sat)	Turb (NTU)	SS (mg/L)	pH
Tully River	<20	<140	<340	<8	<25	<1.5	85-120	<15	<8	6.0-8.0

3.9 Erosion Risk Assessment

A complete assessment of erosion risk involves consideration of a range of factors contributing to erosion at a site. This section presents three different methods of assessing erosion risk that are complementary and when used in an integrated manner provide a more complete understanding of erosion risk, these methods include:

- Average monthly rainfall analysis – a simple assessment useful for understanding temporal erosion risk (**Section 3.9.1**).
- Soil loss estimation – useful for considering erosion risk factors additional to average monthly rainfall (e.g. soils, slope, rainfall erosivity and land management practices) (**Section 3.9.2**).

General observations pertaining to erosion risk associated with high intensity rainfall events and climate change are also provided in **Section 3.9.3** and **Section 3.9.4** respectively. When determining the monthly erosion risk for the proposed construction the highest monthly risk rating will be used to determine the erosion control requirements as outlined in **Section 4.4**.

3.9.1 Rainfall Based Erosion Risk Assessment

Rainfall data from the Tully Sugar Mill weather station (Bureau of Meteorology (BoM) station #032042) has been used to inform this ESCP. This weather station is located approximately 3 km northeast of the Site and has been selected as it provides the most reliable account of rainfall data in proximity to the Site. The dataset extends from 1925 to present (100 years) (BoM, 2025a).

The monthly erosion risk for the Site has been determined based on mean monthly rainfall depth in accordance with IECA 2025 (Table 4.4.2) in **Table 3.6**. Monthly erosion risk range from high to extreme, with the latter corresponding to the highest rainfall months of December to May. Erosion risk ratings are used to determine the erosion control standard for the Project discussed in **Section 4.4.1** of this PESCP.

Table 3.6: Monthly erosion risk based on mean monthly rainfall depth

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean rainfall (mm)[6]	607	732	751	527	332	198	156	128	114	106	166	277	4099
Erosion Risk rating	E	E	E	E	E	H	H	H	H	H	H	E	-

Key: E = extreme, H = high

3.9.2 Soil Loss Estimation

Annual soil loss estimation applying the Revised Universal Soil Loss Equation (RUSLE) can be used to provide a general indication of spatial variability of erosion hazard via the incorporation of variable soil and slope factors across a site. However, the RUSLE is designed to predict long term, average, annual soil loss under sheet and rill flow conditions

[6] Data from BoM for the Tully Sugar Mill (station #032042) accessed online 11.12.2025 at: https://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_startYear=&p_c=&p_stn_num=032042

on short slopes (<300 m) and is limited in that it does not account for soil erosion resulting from concentrated flow conditions (e.g. gully erosion). Further, the RUSLE does not account for the seasonal variability captured by **Table 3.6**.

The RUSLE is applied by IECA 2025 to determine the sediment control standard for smaller sub-catchment areas as described in **Section 4.6.1** of this PESCP.

The RUSLE is calculated as follows:

A = R x K x LS x C x P

Where:

- A = annual soil loss due to erosion in (t/ha/yr)
- R = rainfall erosivity factor
- K = soil erodibility factor
- LS = topographic factor derived from slope length and slope gradient slope / length factor
- C = cover and management factor (a conservative default factor of 1 is applied for construction sites where groundcover type and application rates cannot be predicted)
- P = erosion control practice factor (a conservative default factor of 1.3 is applied for construction sites where erosion control practices cannot be reliably predicted)

3.9.2.1 DETSI RUSLE series mapping

An erosion hazard map derived using the DETSI (DETSI, 2016) RUSLE data series to calculate estimated annual soil loss (based on a 90 m DEM), is provided in **Figure 3.4**. Spatial analysis of annual soil loss estimates shows the soil loss across the Site is predominantly <150 t/ha/y, including across the southern half of the development footprint. The majority of the remaining Site and development footprint is 225-500 t/ha/y, with an isolated area of 500-1,500 t/ha/y to the northwest of the development footprint.

3.9.2.2 RUSLE – estimated annual soil loss

The influence of slope on erosion potential is further demonstrated in **Table 3.7**, which shows the differences in RUSLE soil loss under construction conditions for various relevant slope scenarios with all other factors being equal.

RULSE soil loss estimates have been calculated to demonstrate the relationship between soil loss and slope using the following inputs:

- Rainfall erosivity (R-values) have been utilised for Tully as per IECA (2025) Table E1.
- LS factors for nominal 80 m slope length from IECA (2025) Table E3.
- A conservative soil K factor of 0.04 (sapric loamy topsoils 0.04, over silty clay 0.025) (**Table 3.1**).
- Default C and P values of 1 and 1.3 respectively.

Table 3.7: Application of RUSLE to existing Project slopes

RUSLE factor	**Percentage Slope**				
	1%	**2%**	**3%**	**4%**	**5%**
R	22,970	22,970	22,970	22,970	22,970
K	0.04	0.04	0.04	0.04	0.04
LS	0.19	0.41	0.65	0.91	1.19
C	1	1	1	1	1
P	1.3	1.3	1.3	1.3	1.3
A (t/ha/yr)	230	490	776	1,087	1,418

3.9.2.3 RUSLE – monthly rainfall erosivity and estimated soil loss

Seasonal variability can be captured by the RUSLE by adopting monthly as opposed to annual rainfall erosivity factors. Monthly R-factor values and erosion risk ratings for Tully as per IECA (2025) Table E1 and Table 4.4.4 respectively are shown in **Table 3.8**.

Monthly soil loss rates have been calculated to demonstrate the relationship between soil loss and rainfall erosivity using the following inputs:

- A conservative soil K factor of 0.04 (sapric loamy topsoils 0.04, over silty clay 0.025) (**Table 3.1**).
- LS of 0.65 based on an 80 m slope of 3% from IECA (2025) Table E3.
- Default C and P values of 1 and 1.3 respectively.

Table 3.8: Tully monthly rainfall erosivity factors and erosion risk based on IECA (2025)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
R-factor	4119	5224	4959	2770	1104	460	443	296	312	475	835	1973
Erosion risk	E	E	E	E	H	H	H	H	H	H	H	E
Monthly soil loss (t/ha/m)	139	177	168	94	37	16	15	10	11	16	28	67

3.9.2.4 Soil loss during BESS operation

Upon completion of construction, the BESS area (Project Footprint) will be completely stabilised by compacted hardstand, aggregate groundcover and landscaping with a stormwater drainage system to manage runoff. A stormwater management plan has been prepared for the Project by Water Technology (2025).

Management of the Site will minimise erosion and improve water quality through best practice land management including:

- Grass cover will be maintained and RWE intend to continue livestock grazing to manage fuel loads or other appropriate fuel load management strategies. RWE's operations team will manage the areas to maintain cover >90% throughout the year.
- The Project will fence the wetlands to exclude livestock if grazing is used to manage fuel loads to improve water quality.
- Areas of erosion near the dams on Lot 1 on RP852238 will be stabilised and cover re-established to prevent continued erosion.

Project Area

Development Footprint

Proposed Transmission Line Corridor

Proposed transmission line

20m exclusion zone

Annual soil loss - construction (t/ha/yr):

- 0 - 150 (Very Low risk)
- 150 - 225 (Low risk)
- 225 - 500 (Moderate risk)
- 500 - 1,500 (High risk)
- >1,500 (Extreme risk)

Watercourse

Main Road

Local Road

Lot Parcel

TULLY BESS P-ESCP
RUSLE erosion hazard map

Figure 3.4

N

0 m 100

Attexo

REVIEWED: HS **DRAWN:** KB **SCALE** 1:3,500 **DATE:** 19/09/2025 **DWG No:** RWE-002_005[C]

3.9.3 High Intensity Rainfall and Erosion

Monthly and annual rainfall erosivity factors (R-factors) have been calculated for the Project applying a daily timestep model of rainfall data for the Tully Sugar Mill BoM weather station data from 2005-2025 using the methodology described in Ellis (2018). This corresponds to the last 20 years and is considered to be representative of current climatic conditions.

R-factors calculated using the daily timestep model are higher compared to R-factors for Tully as per IECA (2025) Table E1, although the monthly erosion risk ratings based on R-factor are consistent (Table 3.9). The higher risk ratings derived applying calculated monthly rainfall erosivity values as compared to IECA-derived values demonstrates the influence of rainfall intensity on soil loss rates.

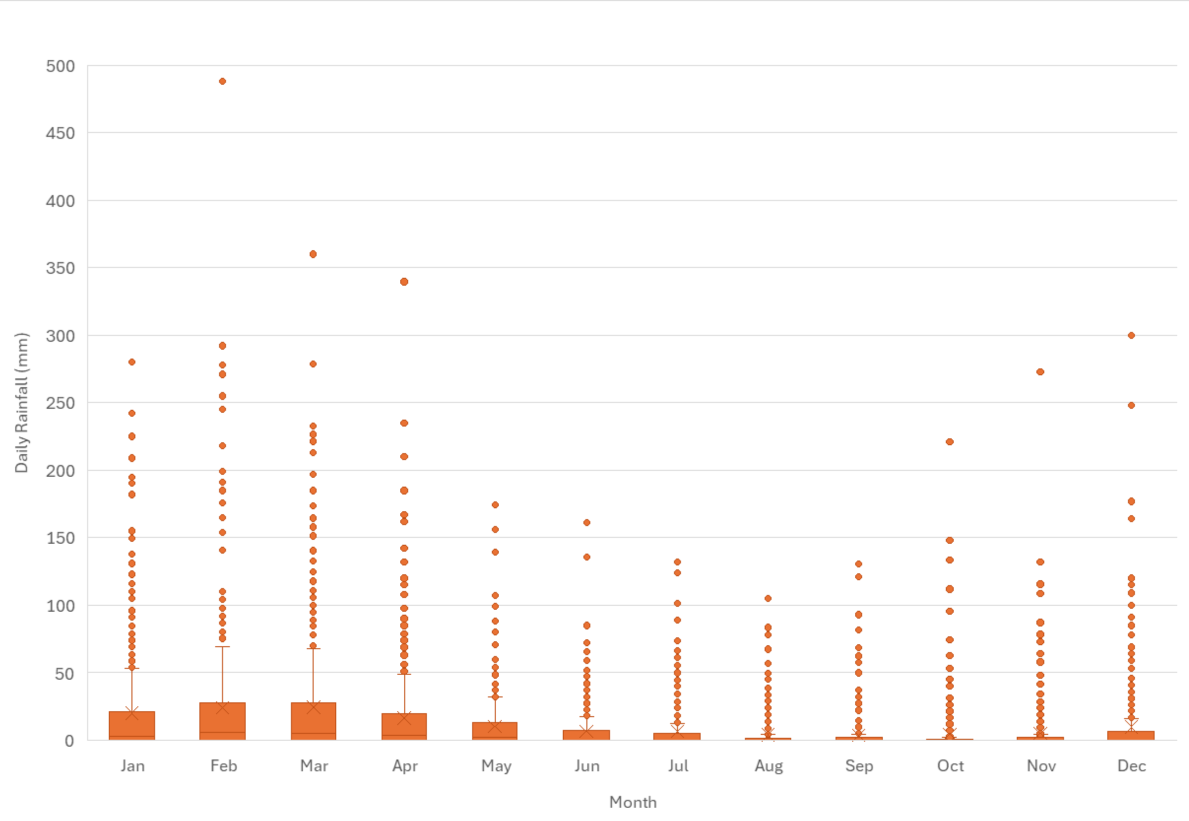
Table 3.9: Monthly erosion risk based on calculated rainfall erosivity factors

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
IECA R-factor	4119	5224	4959	2770	1104	460	443	296	312	475	835	1973
Calculated R-factor	5725	6468	6452	3014	1289	596	641	343	383	694	906	2435
Erosion risk	E	E	E	E	H	H	H	H	H	H	H	E

High intensity rainfall events are part of the climatic regime of the Site, particularly during the peak wet season (December to April inclusive) which is associated with cyclonic or tropical low-pressure systems. Project Construction ESCPs must consider the likelihood of intense rainfall occurring, so that the Development footprint is adequately prepared for these events.

In the absence of fine scale project specific rainfall intensity data, high daily rainfall totals are indicative of high intensity rainfall events. Daily rainfall data from 2005-2025 for the BoM Tully Sugar Mill (station #032042) weather station is presented in **Figure 3.5** as a box plot. The daily outlier events for each month are individually plotted above the outer range of the box plot.

Figure 3.5: Tully Sugar Mill (station #032042) mean daily rainfall outlier events (2005–2025)



3.9.4 Climate Change and Soil Erosion

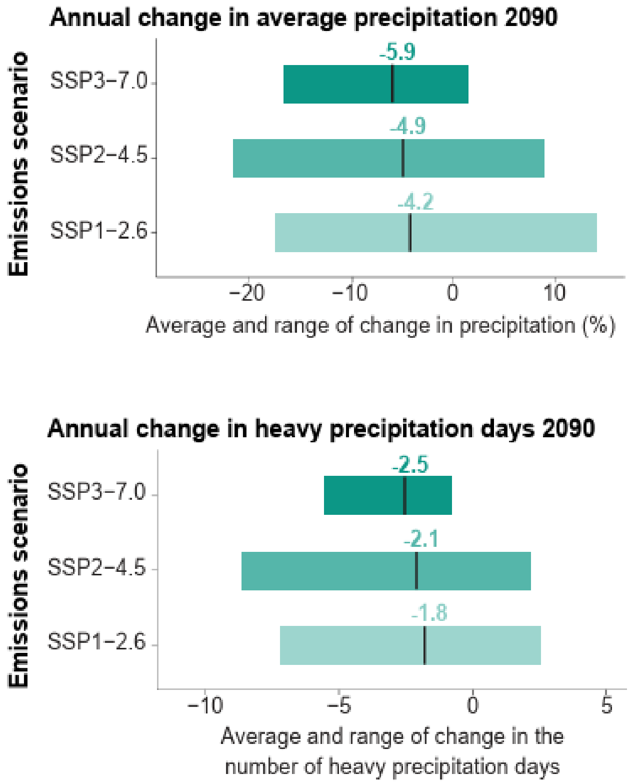
Future climate change scenarios likely to affect soil erosion are related to the amount and intensity of rainfall (i.e. rainfall erosivity) received, and its seasonal distribution. Rainfall seasonality being a consideration in that it can affect antecedent soil moisture conditions, which is a significant factor in the generation of surface water runoff.

Queensland Treasury provides climate projection data for various 'Shared Socioeconomic Pathways' (SSPs) as follows:

- SSP1-2.6: Low emissions future with sustainable development.
- SSP2-4.5: Medium emissions future with socioeconomic trends similar to historical patterns.
- SSP3-7.0: High emissions future driven by strong regional rivalry.

Graphs showing modelled annual changes in average precipitation and heavy precipitation days for the Far North Region are provided in **Figure 3.6**, with the black vertical line on each bar being the multi-model average value and shaded bars showing the range of projected changes applying 15 climate models. Changes shown in the graphs are relative to a 1981–2010 baseline.

Figure 3.6: Graphs showing modelled annual changes in annual precipitation and the number of heavy precipitation days relative to a 1981-2020 baseline (DEC, 2024)



Climate change projections acknowledge significant uncertainty in the magnitude of projected changes in rainfall. Overall, less frequent but more intense tropical cyclones are expected, with a slight decline in the amount of rainfall received and overall number of heavy precipitation days (Department of Energy and Climate [DEC][7], 2024). DEC 2024 climate change projections do not speak to rainfall seasonality.

Given the positive linear relationship between rainfall depth / intensity and soil erosion, the data shown in **Figure 3.6** would suggest an overall reduction in soil erosion resulting from climate change. However, vegetative groundcover is also a significant factor in erosion, with soil loss increasing with decreasing amounts of groundcover (inverse relationship). Reduced rainfall, depending on its seasonality, may result in an overall reduction in vegetative groundcover[8], which would likely offset any net soil loss reduction that may be expected considering rainfall in isolation.

Further, a reduction in vegetative groundcover would leave soils particularly vulnerable to higher intensity rainfall events. Should it be realised, distinct increases in soil loss associated with severe weather events has the potential to place substantial additional pressure on receiving aquatic ecosystems.

Thus, the Project management response for the purposes of minimising increased soil loss and sedimentation impacts due to climate change will involve:

- Maintaining the Development footprint on a day-to-day basis in accordance with best practice standards as described by this plan.
- An increased focus on being prepared for high intensity rainfall events (**Section 4.8**).

[7] now Queensland Treasury.
[8] Absent intervention such as irrigation or a switch to more drought tolerant species.

3.10 Site Constraints

Site constraints have been identified with reference to the IECA Best Practice Erosion and Sediment Control Manuals (Section 3.4) and are discussed in Table 3.10.

Table 3.10: Site constraints

Constraint	Limitation	Description	Management
Soils	Hydrosols (Hewitt)	• Mapped as present within the development footprint. • Indicates presence of commonly inundated, poorly drained soils. • The presence of fibric and sapric topsoils indicates high organic matter content of 'peat' materials. • Acidic soil pH throughout. • Soil properties present challenges for vehicle access, load bearing and revegetation.	• Undertake soil sampling to confirm soil types, characteristics and extent of sodic soils within Development footprint. • Treatment of soil limitations (i.e. sodic or acid soils) to be addressed by the construction ESCP. • Avoid earthworks during wet conditions in areas where high clay content or sodic soils are present.
	Unknown soils (MSC)	• Mapped as present for the OHTL. • Limited information on soil characteristics and limitations, such as sodic, dispersive soils. To be confirmed on-site.	• Treatment of soil limitations (i.e. sodic or acid soils) to be addressed by the construction ESCP. • Top dress dispersive soils with a layer of non-dispersive soil prior to installing scour protection (including vegetation). • Undertake soil amelioration and careful plant selection for revegetation. • Avoid direct revegetation into dispersive soils.
Climate	Rainfall	• The Site is located in an area with consistently high to extreme rainfall erosion risk as per IECA (2025).	• Schedule clearing and ground disturbing works to lower rainfall erosivity months (May-Nov) as far as reasonably practicable.
Sensitive receptors	GBR	• Site is located within the GBR catchment and is subject to the *Reef 2020 WQIP*.	• IECA best practice standard for erosion and sediment control is to be applied to the Project. • Discharge water quality objectives established for the Project are to consider sensitive receptors present. • Sensitive receptors are to be considered by Construction ESCPs. • Buffers will be established around wetlands.
	High ecological significance wetlands	• Within and abutting the eastern portion of the Project boundary.	
	Gulngay National Park	• Located approximately 13.5 km east-southeast of the Site downstream along the Tully River	

3.11 Environmental Values and Threats Analysis

A summary of environmental values potentially impacted by erosion and / or sediment transport are identified in **Table 3.10**, along with the identified potential threats and impacts to these values. Detailed descriptions of the environmental values identified for the Project, where not described herein, are provided in the Ecological Assessment Report for the Tully BESS (Attexo, 2025).

Table 3.11: Environmental values and threats analysis

Environmental value	Potential threats and impacts
Local surface waters including multiple wetlands and higher order ephemeral streams.	Threat: • Sediment transport to natural surface waters. Potential impacts: • Increased opportunity for transport of pollutants via soil particles resulting in reduced water quality. – Subsequent impacts e.g. eutrophication, toxicity, changes to water chemistry etc. • Death of / harm to aquatic organisms (flora and fauna) associated with: – Reduced overall water quality. – Reduced light penetration through water column impacting visibility for fauna and plant photosynthesis. – Smothering of plants and animals by sediment causing suffocation. • Sediment deposits within watercourses introducing barriers to fauna movement or altered flow paths. • Recreational impacts associated with loss of visual amenity and fishing opportunity.
GBR	Threats: • Sediment discharged from the Site is transported to the GBR. Potential impacts: • Smothering of coral resulting in inhibited coral recruitment, reduced growth rates and increased susceptibility to disease. • Reduced light availability impacting photosynthesis by seagrass ecosystems and beneficial reef algae. • Sediment deposits on seabed creating conditions unsuitable for coral larvae and disrupting filter feeding organisms • Smothering of fish, damaging gills and potentially causing death. • Increased transport of land-based nutrients and pollutants to the reef via soil particles and subsequent eutrophication and toxicity impacts. • Reduced resilience of the reef and reef dependent organisms to withstand or recover from other pressures e.g. coral bleaching events.
Surrounding agricultural land-use.	Threat: • Soil erosion. • Sediment deposition. Potential impacts: • Physical impacts associated with significant gully, tunnel and channel erosion such as loss of access to portions of land. • Undermining of access tracks and other built infrastructure.

4. Erosion, Drainage and Sediment Control Practices

The sections to follow identify the principles, standards and strategies to be applied for erosion, drainage and sediment control throughout the Project construction phase. Specific controls are to be defined by construction ESCPs in accordance with the requirements established by this plan.

4.1 ESC Integration and Iterative Management

IECA 2025 recognises that effective ESC requires thorough integration with the construction work program and an iterative process of plan-implement-monitor-update of control measures.

An integrated approach involves the establishment of firm ESC standards and expectations during the Project planning phase, whilst providing flexibility for specific 'on-ground' management measures to be determined by those undertaking the work, so that construction sequencing can occur to minimise risk, and physical controls are compatible with construction methods. Examples of the application of this approach include (but are not limited to):

- Sequencing of works so that overall simultaneous soil exposure is minimised, works with higher erosion potential occur outside of higher rainfall months, and works are scheduled in a way that favours progressive rehabilitation.
- Planning the cut and fill program so that early installation of physical controls is planned, topsoils are effectively managed, the double handling of soils is minimised, and ESCs are adjusted as the site changes with time.
- The planning of resources so that materials, equipment and work crews are available when required for timely ESC and progressive rehabilitation.
- The adoption of controls which are compatible with resources available and familiar to construction crews.

The iterative approach to ESC adopted by IECA 2025 involves:

- Planning: Robust ESCPs developed by suitably qualified and experienced professionals identify the type and location of specific control measures which are selected and designed in accordance with prescribed standards to suit localised site environmental conditions (e.g. soils, rainfall, sensitive receptors etc.).
- Implementation: Experienced ESC practitioners work with the Project delivery team (e.g. managers, foremen, work crews and machine operators) to install / implement the control measures identified by ESCPs. Implementation includes the installation of controls prior to disturbance and maintenance of controls as required, especially prior to and following rainfall events.
- Monitoring: Implemented controls are monitored throughout construction to assess their effectiveness and identify improvements required to ensure ESC objectives are met.
- Update: ESCPs are updated, and on-ground controls adjusted where required to achieve ESC objectives.

The Project will be delivered by RWE in partnership with Construction Contractors. Construction Contractors will coordinate all aspects of Project construction in line with the environmental criteria developed for the Project (including this PESCP). This PESCP establishes clear expectations for ESC against which the Contractors will be held to account, whilst providing flexibility for the design and placement of physical controls by those doing the work. RWE is committed to a maintaining a rigorous environmental assurance program for the Project, which includes the establishment of contractual levers which provide recourse should the standards established by this PESCP not be upheld.

4.2 ESC Guiding Principles

IECA 2025 identifies 10 key principles for effective ESC. A discussion as to how these principles have, or will be, applied by the Project is provided in **Table 4.1**.

Table 4.1: ESC principals

Principle	Project Response
1. Appropriately integrate the development into the site.	• Site constraints including soil, water, vegetation and topography will be considered during Project design. • Access routes and hardstand areas will be positioned to minimise cut and fill for land reshaping and surface modifications. • Trenching and linear disturbance perpendicular to topographical contours will be minimised.
2. Integrate erosion and sediment control issues into site and construction planning.	• Project infrastructure and temporary construction areas will be sited to minimise reprofiling requirements. • Project design to ensure suitable space and locations are available in the construction footprint for required ESC measures. • The timing of clearing and ground disturbing activities will be prioritised to occur outside of the extreme rainfall erosivity erosion risk months of December to April. • ESC standards to be applied during construction are established during the Project planning phase and included within construction tender packs and procurement contracts (i.e. this PESCP).
3. Develop effective and flexible ESCPs based on anticipated soil, weather and construction conditions.	• Construction ESCPs will be developed in accordance with IECA 2025 and implemented by those with control over construction works (supported by a suitably qualified and experienced ESC practitioner). • Soil sampling will be undertaken, and soil characteristics considered as part of the development of Construction ESCPs. • Weather monitoring and wet weather preparedness will be addressed by Construction ESCPs. • ESCs will be regularly monitored and modified as required to achieve water quality objectives.
4. Minimise the extent and duration of soil disturbance.	• Project design will prioritise the co-location of infrastructure to reduce overall land disturbance. • The construction sequence will be managed so that so that simultaneous soil exposure is minimised, and progressive rehabilitation can be undertaken.
5. Control water movement through the site.	• Drainage will be managed to divert all dirty water[9] to an appropriate sediment trap prior to discharge from site. • Drainage design standards will be applied in line with those identified by the Project stormwater management plan and IECA 2025 section 4.3.
6. Minimise soil erosion.	• Construction ESCPs will prioritise erosion prevention by maintaining groundcover and effective drainage controls. • Land clearing, rehabilitation and interim stabilisation will be undertaken in line with IECA 2025 Table 4.4.7.
7. Promptly stabilise disturbed areas.	• Progressive rehabilitation will be considered during work sequencing and undertaken throughout the construction phase. • Land clearing, rehabilitation and interim stabilisation will be undertaken in line with IECA 2025 Table 4.4.7.

[9] As defined by IECA 2025 and in Appendix A.

Principle	Project Response
8. Maximise sediment retention on the site.	• Sediment control techniques will be applied based on the standards defined by IECA 2025 for estimated soil loss or monthly erosivity. • Sediment traps will be designed and positioned by suitably qualified and experienced ESC practitioners.
9. Maintain all ESC measures in proper working order at all times.	• Installed erosion, sediment and drainage controls will be monitored at least weekly and prior to anticipated runoff producing rainfall. • Controls found to be in disrepair will be restored as a priority and as a minimum prior to anticipated runoff producing rainfall.
10. Monitor the site and adjust ESC practices to maintain the required performance standard.	• Installed erosion, sediment and drainage controls will be monitored for effectiveness during and after rainfall events (pending safe access). • Controls identified as not meeting performance criteria will be improved or alternatives sought.

4.3 Project Planning and Design

Project planning and design is a key component of effective management for the minimisation of erosion and sedimentation impacts. Project planning and design will proceed in line with the following principles to minimise erosion risk in the first instance:

1. Design, situate and co-locate infrastructure to make best use of existing topography to aid drainage and minimise disturbance and erosion.
2. Ensure sufficient data is available (e.g. soil characteristics, rainfall and contour data etc.) to inform suitable ESC measures, in particular the avoidance and / or treatment of dispersive soils and soils prone to dust generation.
3. Consider local constraints (soils, topography and hydrology etc.) when determining the location of ESC measures and stockpiles.
4. Calculate soil loss from all disturbed areas to determine temporary and permanent sediment basin sizing and locations.
5. Develop staged ESCPs to be effective during all construction phases.
6. Ensure timing allows for the installation of ESC measures prior to ground disturbance in accordance with the installation sequence specified by construction ESCPs.
7. Ameliorate dispersive soils, particularly in cable trenches and on fill embankments, where there is a high risk of tunnel erosion.
8. Position infrastructure to minimise watercourse crossings and instream works.
9. Initial earthworks and major land disturbing activities will be minimised during extreme rainfall erosivity risk periods (i.e. December to April). Where major land disturbing works are required during extreme rainfall erosivity periods, a commensurate level of erosion and sediment control must be adopted.

4.4 Erosion Control

This section defines the standards and approach that will be applied during Project construction and provides examples of the types of erosion control measures which will be adopted by construction ESCPs. A summary of the specific actions that will be taken to control erosion during Project construction is as follows:

- **Soil amelioration requirements (where required) will be documented** within the construction ESCP or a dedicated soil management plan.
- **Earthworks will be limited to a maximum total area of 9 ha for the BESS facility with limited earthworks expected for the OHTL** .
  - The earthworks extent will be visibly delineated while earthworks are underway.

- The earthworks extent will be delineated by spatial data guiding earthworks activities.
  - The earthworks extent will be communicated with Project personnel via inductions and reinforced during toolbox talks and pre-start meetings.
- **The land clearing and stabilisation timeframes specified in Table 4.2 will be abided** and accounted for within the construction schedule (or equivalent auditable evidence of compliance maintained).
- **Final permanent site stabilisation will be required to achieve a minimum permanent groundcover[10] percentage of 80%** to coincide with the 'extreme' erosion risk groundcover criteria (**Table 4.2**).
- **Final permanent site stabilisation criteria will be signed off as being met** by an accredited ESC and / or rehabilitation practitioner[11] prior to relinquishment of site by the construction contractor.

4.4.1 Erosion Control Standard

The monthly erosion risk values for the site range between high and extreme (**Table 3.6**), corresponding to the highest rainfall erosivity months of December to April. The construction schedule for the Project has not yet been determined; thus, it must be assumed that construction may take place at any time of the year, and all risk ratings must be considered.

Erosion control relies heavily on the maintenance and reestablishment of groundcover. The best practice land clearing and rehabilitation requirements identified for erosion risk rankings specified in IECA 2025, Table 4.4.7 pg. 4.16 will be applied during Project construction. IECA best practice land clearing and rehabilitation requirements for the risk values attributed to the Project in **Table 3.6** and **Table 3.8** are reproduced in **Table 4.2**.

Final permanent site stabilisation will be required to achieve a minimum groundcover percentage of 80% to coincide with the 'Extreme' erosion risk groundcover criteria as described in **Table 4.2**.

Table 4.2: Best practice land clearing and rehabilitation requirements for Project erosion risk.

Erosion Risk[12]	Best Practice Requirement
All cases	• All reasonable and practicable steps will be taken to apply best practice erosion control measures to completed earthworks, or otherwise stabilise such works, prior to anticipated rainfall – including existing unstable, undisturbed, soil surfaces under management or control of the building / construction works.
High	• Land clearing limited to a maximum 4 weeks of work[13]. • Disturbed soil surfaces stabilised with a minimum 75% groundcover[14] within 10 days of completion of works within any area of a work site. • Staged construction and stabilisation of earth batters (steeper than 6H:1V) in maximum 3 m vertical increments wherever reasonable and practicable. • The use of turf to form grassed surfaces given appropriate consideration. • Soil stockpiles and unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 10 days.
Extreme	• Land clearing limited to maximum 2 weeks of work[13]. • Disturbed soil surfaces stabilised with minimum 80%[14] cover within 5 days of completion of works within any area of a work site. • All planned garden beds protected with a minimum 75 mm layer of organic *Mulching*, heavy *Erosion Control Blanket*, *Rock Mulching*, or the equivalent.

[10] For vegetative groundcover, this must comprise perennial species – annual cover crops are not considered as permanent stabilisation.
[11] Accreditation must be through a registered certification body which upholds ethical standards e.g. Envirocert International Inc., Soil Science Australia, the Environmental Institute of Australia and New Zealand or equivalent.
[12] Erosion risk based on the average monthly rainfall and rainfall erosivity shown in Table 3.6 and Table 3.8 of this plan, with best practice requirements as seen in IECA 2025, Table 4.4.7, pg. 4.16.
[13] Refers to the amount of time ahead of the associated works.
[14] May be reduced if the natural cover present is less that the nominated value.

Erosion Risk[12]	Best Practice Requirement
	• Staged construction and stabilisation of earth batters (steeper than 6H:1V) in maximum 2 m vertical increments wherever reasonable and practicable. • High priority given to the use of turf to form grassed surfaces. • Soil stockpiles and unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 5 days.

4.4.2 Erosion Control Strategy

Erosion controls must be prioritised to minimise the area of soils exposed and therefore susceptible to sedimentation in the first instance. Strategies that will be used to prevent unnecessary disturbance, and minimise the length of time soils are left unprotected by groundcover include:

1. Staging of works so that:
   a. Vegetation clearing and grubbing occurs as close as practicable prior to commencement of civil works within that area.
   b. The overall area of soils exposed at any one time is minimised.
   c. The stockpiling and double handling of soils is minimised.
   d. Ground disturbance activities, particularly in high-risk areas, occur within lower rainfall periods.
   e. Progressive site rehabilitation can take place throughout the construction period.
2. The establishment and demarcation of no-go zones, within which access or work is not permitted.
2. Minimising trafficking disturbance by limiting vehicle activity to formed access tracks, with off-track access being restricted to essential vehicles only.
3. Protection of groundcover in temporary disturbance areas via their inclusion within the above no-go zones until works are to commence and then re-incorporating them back into the no-go zone as soon as work is complete, and the area is stabilised.
4. Remediation of temporary disturbance areas within the timeframes specified for best practice land clearing and rehabilitation in **Table 4.2**.
5. Utilisation of temporary groundcovers such as hydraulically applied soil binders, roll on blankets, mulch, gravel or other, to protect exposed soils not ready to be permanently stabilised.
6. Amelioration of soils in-situ prior to excavation, to minimise mixing requirements.
7. The establishment of groundcovers such as rock or gravel over site office, parking and laydown areas.

Dust control will be undertaken via the application of water or an appropriate soil binder where conditions require.

4.4.3 Erosion Control Methods

Erosion control methods recognised as best practice by IECA 2025 are described in **Table 4.3.** Due to the potential presence of dispersive soils (**Section 3.3**), erosion control methods must be applied to minimise soil exposure.

Table 4.3: Erosion control methods

Technique	Application	Advantages	Limitations
Compost blanket	• Used during the revegetation of steep slopes either incorporating grasses or other plants. • Particularly useful when the slope is too steep for the placement of topsoil, or when sufficient topsoil is absent from the slope.	• Long term [15] • Control of wind, raindrop and sheet erosion. • Establishment of sustainable vegetation cover. • Appropriate where topsoil is limited in quality or quantity. • Utility on steeper slopes (up to 1:1).	• Generally unsuitable for concentrated flows. • Requires 100% surface coverage. • Requires significant areas for cost viability.
Mulching	• Control of raindrop impact erosion on flat and mild slopes. May be placed on steeper slopes with appropriate anchoring. • Control water loss and assist seed gemination on newly seeded soil. • Suppression of weed growth on non-grassed areas.	• Short (light) to long (heavy) term. • Practical erosion control prior to vegetation establishment. • Useful raindrop erosion protection. • Can reduce plant watering requirements.	• Requires 100% surface coverage. • Generally unsuitable for concentrated flows. • Can be limited in bushland areas due to introduced seeds. • Should not be placed directly on dispersive soils. • Displaced mulch can become a stormwater pollutant.
Soil binder	• Dust control. • Stabilisation of unsealed surfaces and roads. • Good alternative to mulches where earthworks will resume.	• Once dry, relatively instant protection. • Provides temporary stabilisation during construction.	• Short term (<6 months). • Product and type variability. • Need for trial and error on-site. • Generally unsuitable for concentrated flows. • Surface must remain intact.
Gravelling	• Protection of non-vegetated soils from raindrop impact erosion. • Stabilisation of site office area, car parks and access roads.	• Short term to permanent. • Low cost, trafficable surface. • Reduces mud generation in wet periods.	• Requires 100% surface coverage. • Low shear stress due to small rock size. • Should not be directly placed on dispersive soils.

[15] Based on the successful establishment of vegetation.

Technique	Application	Advantages	Limitations
Revegetation	• Temporary and permanent stabilisation of soil. • Stabilisation of long-term stockpiles	• Short term to permanent[16]. • Best sustainable long-term solution to erosion. • Generally self-regenerating and self-maintaining. • Aesthetic and public amenity value.	• Requires suitable advice on soils and planting considerations. • Usually not suitable in heavy traffic areas or steep slopes (2:1). • Species selection conflicts. • Maintenance and watering costs. • Can take years for suitable development.
Rock mulching	• Stabilisation of long term, non-vegetated banks and minor drainage channels.	• Permanent. • Low cost, trafficable surface.	• Requires 100% surface coverage. • May require weed control blanket for long-term weed control. • Should not be directly placed on dispersive soils.

[16] Usually requires incorporation of light mulching for suitable short term erosion control.

4.5 Drainage Control

Temporary drainage controls will be required during construction to prevent the ingress of clean water and control dirty surface water flows within the site.

A key component of drainage control is ensuring that channels and berms installed to direct surface water flow are designed and constructed to prevent scour so that they do not become sediment sources themselves. Drainage channels, particularly when formed in dispersive soils, are especially prone to scour. Dispersive soils are not mapped, however there are high clay content subsoils present within the Site; hence the following measures will be taken to mitigate scour of drainage devices:

- The flow velocity of temporary drainage channels will be calculated applying Manning's Equation (or alternative method if determined to be appropriate by a Registered Professional Engineer of Queensland (RPEQ) specialising in hydraulics as part of construction ESCP design, prior to the commencement of works within that area (allowing for staged construction).
- Temporary drainage channels will be designed at a gradient that limits the maximum flow velocity to a value not exceeding that of the surface material; OR
  - Flow velocities will be reduced through the placement of check dams (where the channel does not comprise dispersive soils); or
  - The scour resistance of the drain will be increased using a channel liner selected to suit the calculated flow velocity in accordance with IECA 2025 A5.6.
- Check dams will not be placed directly over dispersive soils; these drains must be lined.
- V-drains will not be used where drain surfaces comprise dispersive soils, these drains will be either u-shaped or trapezoidal.
- Diversion bunds will not comprise an exposed dispersive soil surface.
- Construction ESCPs must be signed off by a suitably qualified and accredited ESC practitioner[17] as having met the requirements of IECA 2025 and this ESCP.
- Drainage controls must be inspected by a suitably qualified and accredited ESC practitioner[17] or Registered Professional Engineer of Queensland (RPEQ) and signed off as having been installed in accordance with design.
  - Inspections will occur following drainage controls being installed within that section of the site.
  - Where on ground deviations are observed that nevertheless meet the requirements of IECA 2025 and this ESCP, the construction ESCP will be updated to reflect implemented controls.
  - Installed drainage controls that fail to meet the requirements of IECA 2025 and this ESCP will be modified to meet these criteria following identification.

4.5.1 Drainage Control Standard

Where not otherwise specified in RPEQ approved stormwater management plans, temporary drainage controls used for ESC purposes will be designed as per Table 4.3.1 of IECA 2025 recommendations for temporary drainage structures in Queensland:

- Design life <12 months: 1 in 2-year event.
- Design life 12-24 months: 1 in 5-year event.
- Design life >24 months: 1 in 10-year event.

Whilst the entire construction period is expected to extend for up to 18 months, works will be staged, meaning standards for lesser design timeframes may be able to be applied.

A stormwater management plan has been prepared for the Project by Water Technology (2025).

[17] Accreditation must be through a recognised certification body which upholds ethical standards e.g. Envirocert International Inc., Soil Science Australia or equivalent.

4.5.2 Drainage Control Strategy

The following strategies / principals will be applied during the design and establishment of temporary drainage controls for construction ESC:

1. Prevent mixing of clean and dirty water where practicable.
2. Divert clean water away from work areas wherever practicable, where this cannot be achieved, control clean water flows through the site to avoid contamination (by sediment).
3. Divide unstable slopes using catch drains or flow diversion banks, at the intervals recommended by IECA 2025 Table 4.3.2 for slope length and steepness considering groundcover percentage.
4. Ensure that installed drainage features are suitable for the slope, appropriately sized and sufficiently lined to prevent scour.
5. Allow water to shed from unsealed access tracks at regular intervals.
6. Utilise appropriate outlet structures at discharge points to prevent downstream scour.
7. Avoid structures that pond water at locations prone to tunnel erosion.
8. Avoid concentration of flow and maintain sheet flow conditions where practicable.

4.5.3 Drainage Control Methods

Drainage controls, whether permanent or temporary, will be designed and constructed to limit flow velocity to a value not exceeding the maximum allowable velocity for the given surface material in accordance with IECA 2025. Controls can influence slope gradient and length, channel roughness, flow depth, velocity and discharge to minimise erosion and manage sediment.

A summary of drainage control techniques recognised by IECA 2025 and their application is provided in **Table 4.4** with examples of specifications as per IECA (2025) contained in **Appendix B**. The adoption and placement of these techniques will be determined by construction ESCPs.

Table 4.4: Drainage control techniques

Technique	Typical use	Advantages	Limitations / Disadvantages
Check dams	• Control flow velocity in unlined, low-gradient drains to prevent scour. • Provide some sediment capture and can function secondarily as sediment control devices.	• Various types of check dams are available for different conditions: – Fibre rolls, triangular and sandbag check dams where drains are less than 500 mm deep. – Rock check dams where drains exceed 500 mm deep. – Compost-filled bags where velocity and filtration or adsorption is needed. • Generally quick and inexpensive to install. • Low maintenance (if properly installed).	• Effectiveness is governed by height and spacing of the check dam, subject to the slope of the drain. • Typical maximum applicable channel gradient of 10% (1:10). • If not installed correctly, can cause flow to leave the drain. • Should not be placed on dispersive soils.
Catch drains	• Small open channels formed at intervals down a slope or adjacent to disturbance to: – Control flow lengths in low-gradient sheet-flow slopes to minimise rill erosion. – Direct runoff around soil disturbance or unstable slopes. – Collect 'dirty' water and direct it to sediment traps. – Collect and divert up-slope water around stockpiles and soil disturbance.	• Generally quick and inexpensive to establish or re-establish. • Standard designs are available for various site conditions. • Can avoid need for channel lining if constructed at appropriate gradients.	• Effectiveness is governed by spacing of drains down the slope, maximum catchment area, lining material and channel gradient. • Design must be based on local hydrologic and soil conditions, especially where soils are dispersive. • Deep V-shaped drains will scour and should be avoided. • Must discharge to a stabilised outlet. • Can be an impediment to vehicle and machinery movement around site.

Technique	Typical use	Advantages	Limitations / Disadvantages
Flow diversion banks	• Raised earth embankments placed along or near ground level on low gradient slopes, to: – Direct sheet runoff from slopes and transport across slopes to a stable outlet. – Direct water to the inlet of a chute or slope drain. – Collect and divert up-slope water around stockpiles and soil disturbance.	• Generally quick and inexpensive to establish or re-establish. • Favoured over catch drains where subsoils are dispersive to avoid exposing subsoils.	• Effectiveness is governed by flow capacity and scour resistance. • Can cause sediment problems and flow concentrations if overtopped by storms. • Must discharge to a stabilised outlet. • Can be an impediment to vehicle and machinery movement around site.
Diversion channels	• Formally designed, excavated channels on low gradient slopes which: – Collect and transport runoff around or through a site. – Collect 'dirty' sediment downslope and direct it to a sediment trap. – Temporarily divert an existing drainage channel during construction activities.	• Low maintenance requirements (if designed and installed correctly). • In larger catchments, diversion of 'clean' water around disturbances can result in large cost savings. • Hydraulic capacity can be significant increased when formed with a downslope flow diversion bank.	• Sized for a specific flow rate which is limited based on catchment, topography, soils and hydrology. • Critical parameters of surface lining, hydraulic capacity and discharge point stability. • Can be an impediment to vehicle and machinery movement around site. • Can be a source of sediment if capacity is exceeded by rainfall.
Chutes	• Steep, open channel running down slopes used to convey flows down gradients usually steeper than 10%. • Used to transport concentrated flow down steep slopes, commonly used on constructed slopes e.g. batters.	• Temporary chutes can be inexpensive and quick to construct. • Typically have a flow capacity much greater than slope drains.	• Critical design considerations of flow entry, allowable velocity and dissipation at the base. • Local topography must allow safe collection and passage of water into the chute. • Some linings have short surface life. • Significant damage can occur if chutes are overtopped.

Technique	Typical use	Advantages	Limitations / Disadvantages
Slope drains	• Temporary water transmission pipe (flexible, solid wall or lay-flat) anchored to the side of a slope, with a stabilised inlet and outlet. • Commonly used to: – Transport minor concentrated flow down embankments greater than 3 m high. – Divert 'clean' water around a site. – Convey water down a newly formed embankment prior to installation of permanent drainage.	• Economical for low flows and high, irregular drops. • Relatively easy to relocate and re-use. • Effective for temporary diversion of water through bushland or areas where disturbance is to be minimised.	• Critical design consideration is the hydraulic capacity of the inlet. • Local topography must allow safe collection and passage of water into the inlet. • Usually only economical for low flows, chutes are preferred for high flows. • Commercially available pipes usually limited to ~300-75 mm diameter. • Inlet can be impeded by sediment and debris. • Prone to wash-out in severe storms.
Outlet structures	• Used at the discharge point of chutes and slope drains to dissipate flow energy and control scour. • Wide range of controls designed to minimise the risk of soil erosion at outlets and undermining of pipes/headwalls. • Options include rock pads, rock mattress aprons and various impact-type dissipaters.	• Quick to install. • Rock can often be retained as a permanent erosion control measure.	• Critical design considerations are mean rock size and length of protection. • If not correctly installed (length, width, depth or rock or recession and direction of flow) erosion can commonly occur around the edge of the rock pads. • Generally ineffective in controlling high-velocity outlet 'jetting'.
Level spreaders (outlet structure)	• Level, grassed side-flow weirs constructed along the contour to convert minor concentrated flow to sheet flow prior to release. • Can be used as an outlet for catch drains and flow diversion banks.	• Inexpensive to construct and maintain.	• Flow must be released as sheet flow over a stable, well-grassed surface to maintain suitable flow conditions downslope. • Critical design considerations are the length and level construction of the outlet sill, which can be difficult to construct with precision. • Can limit machinery movement on site, which must be excluded from the area of the level spreader. • Not suitable for highly erosive or dispersive soils, or where vegetation cover is poor.

4.6 Sediment Control

Sediment traps will be utilised across the Development Footprint to treat stormwater run-off to capture entrained sediment prior to stormwater discharge from this area of disturbance. The following actions must be taken to ensure that sediment controls are designed, installed and maintained to the IECA 2025 international best practice standard:

- From the commencement of ground disturbing activities through to the achievement of stabilisation criteria within a particular site drainage sub-catchment - all dirty stormwater run-off from within the Development footprint must be directed to a sediment trap for treatment prior to release from site.
- Sediment traps must remain in place until 80% groundcover has been achieved within the upstream drainage sub-catchment draining to that trap.
- All sediment traps must be selected, positioned and sized by an accredited ESC practitioner[18] and signed off as having met the IECA 2025 BPESC Standard and the requirements of this ESCP.
- All sediment basins must be designed by an RPEQ and signed off as having met the IECA 2025 BPESC Standard by an accredited ESC practitioner.[18]
- Where installed, sediment basins must be inspected by a suitably qualified and accredited ESC practitioner[18] or RPEQ and signed off as having been installed in accordance with design.
  - Inspections must occur following of completion of sediment basin construction.
  - Where slight deviations are observed that nevertheless meet the requirements of IECA 2025 BPESC Standard and this ESCP, the construction ESCP must be updated to show the basin as constructed.
  - Installed sediment basins that fail to meet the requirements of IECA 2025 BPESC Standard and this ESCP must be modified to meet these criteria following of identification.
- Stabilised site exits must be established to prevent the tracking of soils offsite by vehicles in accordance with IECA 2025.
- The efficacy of sediment traps will be reviewed where monitoring indicates that those in place are failing to achieve WQOs (**Section 5.3**)

4.6.1 Sediment Control Standard

Sediment controls are grouped by their ability to trap a specified grain size as shown in **Table 4.5**. Sediment traps which are not considered sufficiently effective to be classed as Type 1, 2 or 3 are referred to as supplementary controls. Despite their reduced effectiveness, supplementary controls are considered a useful component of best practice sediment control when employed in tandem with Type 1, 2 and 3 controls.

Table 4.5: Classification of sediment traps based on soil particle size (as seen in IECA 2025, Table 4.5.5 page 4.26)

Classification	Minimum Particle Size	Typical Trapped Particles
Type 1	<0.045 mm	Clay, silt & sand
Type 2	0.045-0.14 mm	Silt & sand[19]
Type 3	>0.14 mm	Sand
Supplementary	>0.42 mm	Coarse sand

The sediment control standard to be applied across the various sub-catchment areas within the Project Development footprint will be determined by construction ESCPs based on calculated soil loss rates once sufficient information is available to meaningfully apply the RUSLE (i.e. applying civil design for the determination of sub-catchments and soil

[18] Accreditation must be through a recognised certification body which upholds ethical standards e.g. Envirocert International Inc., Soil Science Australia or equivalent.
[19] Silt particles technically have a grain size of 0.002 to 0.02 mm, which means that only Type 1 sediment traps are likely to capture silt-sized particles. However, for general discussion, it can be assumed that Type 2 systems capture a significant proportion of silt-sized particles.

data for locally derived soil erodibility [K] factors). The sediment control standard will be determined in accordance with **Table 4.6**.

Table 4.6: Sediment control standards (default) based on soil loss rate (as seen in IECA 2025, Table B1, page B.6)

Catchment Area (m^2) [20]	**Soil Loss (t/ha/yr)** [21]		
	Type 1 [22]	**Type 2**	**Type 3**
250	N/A	N/A	Default[23]
1000	N/A	N/A	All cases
25000	N/A	>75	75
>2500	>150	150	75
>10,000	>60	N/A	60

Based on the size of the Project footprint, the soil loss estimates identified in **Section 3.9.2** and site soil characteristics (**Section 3.2**), it is expected that Type 1 sediment controls (i.e. sediment basins) will be required.

4.6.2 Sediment Control Strategy

The following strategies will be applied for sediment control during Project construction:

1. Sediment traps will be designed and positioned by a suitably qualified person.
2. Sediment laden runoff from construction areas will be directed to an appropriate sediment control device in accordance with the required treatment standard.
3. Sediment will be trapped as close to its source as practicable.
4. Stabilised site exits will be established to prevent the tracking of soils offsite by vehicles.
5. All sediment control measures will be designed, installed, operated and maintained in accordance with IECA, 2025.
6. All material removed from sediment traps during maintenance will be disposed of in a manner that does not cause ongoing soil erosion or environmental harm.

4.6.3 Sediment Control Methods

A summary of the Type 1 and Type 2 sediment control methods recognised by IECA 2025 is provided in **Table 4.7** with examples of specifications as per IECA (2025) contained in **Appendix B**. In addition to Type 1 and 2 controls, the Type 3 and supplementary controls described in **Table 4.8** will also be implemented as directed by construction ESCPs.

[20] *Area is defined by the catchment area draining to a given site discharge. Sub-dividing a given drainage catchment shall NOT reduce its 'effective area' if runoff from these areas ultimately discharges from the site at the same general location. The 'area' does not include any 'clean' water catchment that bypasses the sediment trap. The catchment area shall be defined by the 'worst case' scenario, i.e. the largest effective area that exists at any instance during the soil disturbance* (IECA 2025, Table B1, page B.6).
[21] *Soil loss defines the maximum allowable soil loss rate (based on RUSLE analysis) from a given catchment area. A slope length of 80m should be adopted within RUSLE analysis unless permanent drainage or landscape features reduce its length* (IECA 2025, Table B1, page B.6).
[22] *Exceptions to the use of sediment basins shall apply in circumstances where it can be demonstrated that the construction and / or operation of a sediment basin is not practical, such as where the available workspace does not provide sufficient land area. In these instances, the focus must be erosion control using techniques to achieve an equivalent outcome* (IECA 2025, Table B1, page B.6).
[23] *Refer to the relevant regulatory authority for assessment procedures. The default standard is a Type 3 sediment trap.*

Table 4.7: Type 1 and Type 2 sediment control techniques

Type 1	Typical Use / Features	Type 2	Typical Use / Features
Sheet flow treatment techniques			
Buffer zone – capable of infiltrating 100% of stormwater runoff or process water.[24]	• Most suited to sandy soils • Generally, only suitable for rural and rural-residential building/construction sites. • Can provide some turbidity control whilst the zone remains unsaturated.	Buffer zone – capable of infiltrating the majority of flows from design storms.	• Most suited to sandy soils. • Generally, only suitable for rural and rural-residential building/construction sites. • Can provide some turbidity control whilst the zone remains unsaturated.
Concentrated flow treatment techniques			
Type A sediment basin[25]	• Considered the most effective traps for clayey soils. • Pond size is governed by both minimum volume and minimum surface area. • Operation relies on the installation of an automatic chemical dosing system. • A floating decant system collects water from the top of the water column during the storm events. • In most circumstances, the settling pond is required to be de-watered to the nominated static level prior to a rain event that is likely to produce run-off. • Temporary basins are typically sized for the 1 year ARI, 24 hour storm event.	Block & aggregate drop inlet protection	• Small to medium catchment areas. • Filter cloth can be added between aggregate and blocks to improve removal of fine sediments. • Depth of upstream ponding is controlled by the height of the blocks.
		Excavated sediment trap with Type 2 outlet	• Most suited to sandy soils. • Efficiency can be significantly compromised by inflow jetting. • Can present a safety risk to workers and public. • Often used a coarse sediment trap upslope of type 2 sediment trap. • Useful where not safe/desirable to pond water above ground level.
		Filter sock	• Suitable for all soil types.

[24] Buffer zone must be able to infiltrate all inflow into the ground such that there is no surface discharge from the buffer zone.
[25] Classification based on being sized in accordance with best practice standards per IECA 2025, otherwise the technique attracts a lower classification.

Type 1	Typical Use / Features	Type 2	Typical Use / Features
Type B sediment basin[25]	• Pond size is primarily governed by a minimum required surface area. • These basins are typically larger in volume and surface area than Type A basins. • Operation relies on the installation of an automatic chemical dosing system. • Ideally, the settling pond should be dewatered prior to a run-off producing rainfall event; however, during dry conditions water may be retained for use. • Temporary basins are typically sized for a discharge of 0.5 times the peak 1 in 1 year ARI critical duration storm.	Filter tube dam	• Minor concentrated flows. • Generally better than U-shaped sediment trap for low flows. • Can be integrated into Type 2 and 3 traps to improve minor flow efficiency.
		Mesh & aggregate drop inlet protection	• Small to medium catchment areas. • Depth of upstream ponding is controlled by the height of the aggregate filter.
Type C sediment basin[25]	• Type C basins are limited to works within non-dispersive, low clayey, sandy soils and are not expected to be applicable for the MREH Project.	Rock & aggregate drop inlet protection	• Best used in coarse-grained (low clay) soil areas. • Large construction sites such as dual-carriageway located in medians trip. • Locations where space is not critical.
Type D sediment basin[25]	• Pond size is governed by a minimum required volume. • Operation of the basin normally relies on chemical dosing, using either an automatic or manual chemical dosing system. • The settling pond is required to be dewatered to the bottom of the settling zone prior to a rain event that is likely to produce runoff.	Rock filter dam	• Used where there is sufficient room for relatively large rock embankment. • Filter cloth incorporation is preferred for removal of fine sediment but can cause maintenance issues. • Aggregate filter can be used in sandy soils, normally on longer term traps with regular de-silting.
		Sediment trench	• Used in long, narrow spaces. • Used at the base of fill batters with limited space between toe and site boundary.

Type 1	Typical Use / Features	Type 2	Typical Use / Features
	• Temporary basins are typically sized for the 80%ile, 5-day rainfall depth, depending on catchment conditions and risk.	Sediment weir	• Used where space is limited (i.e. insufficient for use of rock filter dam). • Where the trap may be subject to regularly over-topping flows. • Used as an outlet structure on minor Type 2 sediment basins.

Table 4.8: Type 3 and supplementary sediment controls

Application	Control (type)	
Sheet flow conditions	• Buffer zone (3) • Filter fence (3) • Modular Sediment Trap (3) • Sediment Fence (3)	• Grass filter strips (supplementary) • Fibre rolls (supplementary) • Stiff grass barriers (supplementary)
Concentrated flow conditions	• Modular/U-shaped/Coarse Sediment Trap (3) • Excavated drop inlet protection (3) • Excavated sediment trap with type 3 outlet (3) • Fabric drop inlet protection (3)	• Fabric wrap filed inlet sediment trap (3) • Check dam sediment traps (supplementary) • Kerb inlet sediment traps (supplementary) • Straw bale barriers (supplementary)
Dewatering sediment control techniques	• Compost berm (3) • Filter fence (3) • Grass filter bed (3) • Hydrocyclone (3)	• Portable sediment tank (3) • Sediment fence (3) • Grass filter beds (supplementary)
Construction exists	• Rock pads (supplementary) • Vibration grids (supplementary)	• Wash bays (supplementary)

4.7 Soil Stockpile Management

Soil stockpiles will be managed as follows:

- Topsoils are to be handled and stockpiled separately from subsoils for use in site rehabilitation (though this can be at the same location).
- Avoid any reduction in soil quantity or quality with regard to soil characteristics to maintain soil resources for rehabilitation.
- Stockpiles must be:
  - Located within the sediment control envelope.
  - Located away from areas subjected to concentrated overland flow.
  - Isolated from sensitive receiving environmental receptors such as waterways.
- Upslope overland flows must be directed around stockpiles where the upslope catchment exceeds 1,500 m^2 and the average monthly rainfall exceeds 45 mm.
- Stormwater runoff originating from stockpiles must be directed to a suitable sediment trap.
- Soil stockpiles must be covered where the displacement of stockpiled materials has the potential to cause environmental harm, including mulch, vegetative cover, soil binders or impervious blankets when:
  - Long term (>28 days) stockpiling of dispersive soils;
  - Long term (>5/10 days) during high-risk months (**Table 3.8)**; or
  - Stockpiling clayey soils when turbidity control is required.

4.8 Rainfall / Storm Preparedness

Weather monitoring and wet weather preparedness must be addressed by construction ESCPs. Weather monitoring must be undertaken on a daily basis during construction. The amount of rainfall required to generate surface water run-off at the site (i.e. the minimum run-off producing rainfall event) is to be determined onsite through monitoring and established as a trigger for site preparation and additional rainfall related monitoring. In the interim, if a single rainfall event in excess of 25 mm is forecast, the following is to be undertaken:

- A thorough inspection of all ESC control measures within 24 hours of the event.
- Maintenance and rectification of ESC controls to ensure that they are in proper working order prior to the rainfall occurring.

Sufficient ESC materials and equipment must be maintained available onsite to ensure that ESCs are able to be maintained as fully functional, this includes spare materials should they be required at short notice to ensure the Project Development footprint is adequately prepared for high intensity rainfall.

If high intensity rainfall is predicted, priority must be given to ensuring the Project Development footprint is adequately prepared, this includes diverting all resources necessary, including personnel, machinery and equipment, to works required for site stabilisation and ESC maintenance.

4.9 Dewatering

Dewatering is not expected to be required for the purposes of extracting groundwater from excavations. Dewatering required for other purposes, such as for the dewatering of soil stockpiles, removal of trapped stormwater run-off from the Site (e.g. within trenches and excavations), or the maintenance of sediment traps (e.g. sediment basin dewatering) will be undertaken in accordance with procedures specified within construction ESCPs.

Dewatering processes for the maintenance of sediment basins will be designed to achieve:

- 90 percentile TSS concentration not exceeding 50 mg/L
- Water pH between 6.5-8.5.

Note that these criteria are intended for treated water from dewatering activities and not all discharges of stormwater run-off from site.

4.10 Dust Management

Specific measures for the management of dust during construction must be addressed by construction ESCPs and / or CEMPs developed by construction contractors and will include:

- Dust suppression techniques such as the use of water carts, soil binders and / or soil ameliorants.
- Minimisation of high dust generating activities during particularly dry and windy conditions.
- The implementation of speed limits on unsealed access tracks.
- The positioning and / or protection of soil stockpiles to minimise wind exposure.
- Covering of loads with the potential to generate dust whilst in transit.

5. ESC Monitoring, Maintenance and Reporting

5.1 ESC Inspections

ESC monitoring and maintenance programs will be documented within construction ESCPs in accordance with IECA 2025 and this PESCP. This will include the development of inspection check sheets and other aids to facilitate thorough checks of controls in place and discharge points. Inspections will be undertaken by a suitably experienced ESC practitioner.

The minimum ESC monitoring requirements for the Project are summarised in **Table 5.1**.

Table 5.1: Minimum ESC monitoring requirements[26]

Frequency	Inspection Requirement
Regular Inspections	
Weekly site inspections	• Checks of all drainage, erosion and sediment control measures. • Occurrence of excessive sediment deposition (whether on or off-site). • Checks of all site discharge points (e.g. for scour or sediment deposition). • Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements. • Litter and waste receptors.
Monthly inspections	• Surface coverage of finished surfaces (both area and percentage cover). • Health of recently established vegetation. • Proposed staging of future land clearing, earthworks and site / soil stabilisation.
Rainfall Related Inspections	
Prior to anticipated runoff-producing rainfall (within 24 hours of rainfall occurring)	• Checks of all drainage, erosion and sediment control measures. • Checks of all temporary flow diversion and drainage works.
Daily site inspections during runoff producing rainfall	• Checks of all drainage, erosion and sediment control measures. • Occurrence of excessive sediment deposition (whether on or off-site). • Checks of all site discharge points (e.g. for scour or sediment deposition).
Following run-off producing rainfall (within 18 hours)	• Treatment and dewatering requirements for sediment basins. • Sediment deposition within sediment basins and the need for its removal. • All drainage, erosion and sediment controls. • Occurrences of excessive sediment deposition (whether on or offsite). • Occurrences of construction materials, litter or sediment placed, deposited, washed, or blown from the sites, including deposition by vehicle movements. • Occurrences of excessive erosion, sedimentation or mud generation around the site office, car park and / or material storage areas.

[26] As per IECA, 2025 section 7.4

5.2 ESC Maintenance

ESC measures must be maintained until the site is stabilised and they are no longer required as follows:

- As a minimum, ESCs are to be maintained so that they are in proper working order prior to forecast rainfall events.
- To the extent practicable, controls are to be maintained in proper working order to provide protection for unanticipated rainfall events.
- Sediment traps are to be cleaned out and maintained in line with the operational standard for that device.
- As required to mitigate potential safety risks.

The adequacy of controls is to be reviewed considering water quality outcomes and ESCPs updated as required to achieve ESCP objectives.

5.3 Water Quality Outcomes / Objectives

The Project is committed to achieving no net worsening of the quality of downstream water receptors.

The default standard offered by IECA, 2025 of the 90th percentile suspended solids not exceeding 50 mg/L will be adopted as the water quality objective for discharges of treated water from sediment basins.

5.4 ESC Failures, Corrective Actions and Reporting

If a site inspection or environmental monitoring identifies a failure of the adopted drainage, erosion and sediment control measures, or that environmental outcomes have not, or will not be, achieved, an evaluation will be undertaken to determine the cause and appropriate corrective actions. Corrective actions are most effective when developed on a case-by-case basis so that they are targeted to address the causes identified as leading to a specific event.

Notwithstanding, corrective actions and reporting requirements have been identified for potential ESC failures in **Table 5.2**. The nominated corrective actions will be implemented in conjunction with those identified as part of the post event evaluation process. Where a conflict occurs, corrective actions identified as part of an event specific investigation process will prevail.

ESC related incidents will be logged, responded to, and reported on in line with processes described by construction ESCPs and Construction Environmental Management Plans (CEMPs).

Table 5.2: ESC non-conformances / failures and corrective actions

Description	Examples	Corrective Action	Reporting Requirement
The construction ESCP has largely been implemented, however minor deviations, coverage gas or maintenance requirements are identified. Rectification can be achieved within 48 hrs and prior to forecast run-off producing rainfall.	A break in perimeter bunding is identified providing opportunity for the release of dirty water without prior treatment.	Mobilise the materials, equipment and personnel required to rectify the identified gap / maintenance requirement within 48hrs, or prior to forecast rainfall, whichever is sooner.	Nil
	Rock check dams are incorrectly installed or of insufficient frequency.		
	A Type 2 sediment trap is identified as being full and requiring maintenance.		
Material deviations from this PESCP and / or construction ESCPs are identified.	Land-clearing and / or stabilisation criteria (**Table 4.2**) have not been met: 1. Vegetation clearing has extended beyond clearing ahead timeframes. 2. Stabilisation timeframes have not been met.	1. Vegetation clearing is to cease until construction works are within clearing ahead timeframes. An interim ESCP is to be developed and implemented for the additional cleared area and identified interim stabilisation measures applied e.g. the spreading of woodchip mulch or application of soil binder to exposed soils, installation of perimeter bunding to prevent stormwater run-on to the area and direct run-off from areas of exposed soils to a sediment trap. 2. Immediate measures are to be taken to stabilise the area – temporary groundcover must be achieved.	Finding and details of corrective action taken to be included in routine monthly report
	Perimeter controls (e.g. bunding and sediment traps) have not been installed and ground disturbing works have commenced.	Works are to cease until ESCs have been installed in accordance with the construction ESCP. ESCs must be installed within 48 hrs or prior to forecast rainfall, whichever is sooner.	
	Drainage channels are not shaped, sized and / or lined in accordance with the relevant construction ESCP.	Priority will be given to allocation of resources (machinery etc.) necessary to reform / line the drain - accordance with the construction ESCP will be achieved. An interim temporary drain liner (e.g. roll on fabric) must be installed where rainfall is forecast.	

Description	Examples	Corrective Action	Reporting Requirement
The construction ESCP has been implemented however monitoring indicates that ESCP objectives are not being met.	Sediment deposits are identified outside of the Project Development footprint which are attributable to the Project.	Sediment deposits are to be recovered; where this cannot occur due to access limitations or excessive disturbance, the deposit is to be stabilised in-situ. A suitably qualified and accredited ESC practitioner[27] is to review controls and amend the ESCP to increase sediment capture at that location.	Finding to be included in routine monthly report
	Water quality monitoring results do not align with construction ESCP water quality objectives.	A suitably qualified and accredited ESC practitioner[27] is to inspect the site within 10 business days of the finding, identify sediment sources and: • make recommendations for immediate corrective actions to stabilise sediment sources; and • review and amend the ESCP to improve erosion prevention and increase sediment capture. An assessment of environmental harm is to be completed and reporting undertaken commensurate to the outcome in accordance with the EP Act.	Finding to be reported to RWE within 2 business days of becoming aware of the failure.
Failure to implement nominated corrective actions.	Monthly reporting indicates that corrective actions identified to address failures / non-conformances have not been implemented, for example: Water quality monitoring results do not align with ESCP objectives, the 10-business day timeframe has been exceeded however a qualified and accredited ESC practitioner[27] has not inspected the site.	RWE to escalate matter and take action in accordance with Project governance processes	Regulatory reporting in accordance with EP Act and / or approval conditions.

[27] Accreditation must be through a recognised certification body which upholds ethical standards e.g. Envirocert International Inc., Soil Science Australia or equivalent.

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- Water Technology Pty Ltd (2025) *Tully BESS Stormwater Management Plan and Flood Assessment*. Project Report 3 September 2025.

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Appendix A

Definitions

Table A.1: Definitions

Term / Acronym	Definition
AHD	Australian Height Datum
ANZG	Australian and New Zealand Governments
RWE	RWE Corporation Pty Ltd
Attexo	Attexo Group Pty Ltd
BESS	Battery Energy Storage System
BGL	Below Ground Level
BoM	Bureau of Meteorology
BPESC	Best Practice Erosion and Sediment Control
CEC	Cation Exchange Capacity
CEMP	Construction Environmental Management Plan
Cth	Commonwealth
DAF	QLD Department of Agriculture and Fisheries
DCCEEW	Cth. Department of Climate Change, Energy, the Environment and Water
DEC	QLD Department of Energy and Climate (now Queensland Treasury)
DETSI	QLD Department of Environment, Tourism, Science and Innovation
DSDIP	Department of State Development, Infrastructure and Planning
ECEC	Effective Cation Exchange Capacity
EP Act	QLD Environmental Protection Act 1994
EPBC Act	Cth. Environment Protection and Biodiversity Conservation Act 1999
EPP (Water and Wetland Biodiversity)	Environmental Protection (Water and Wetland Biodiversity) Policy 2009
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
EV	Environmental Values
GBR	Great Barrier Reef
GBRCA	Great Barrier Reef Catchment Area
GBRMP	Great Barrier Reef Marine Park
GBRNHP	Great Barrier Reef National Heritage Property
GBRWHA	Great Barrier Reef World Heritage Area
GED	General Environmental Duty
IECA	International Erosion Control Association
IECA 2025	IECA Best Practice Erosion and Sediment Control Guidelines
GBR	Great Barrier Reef
GBRCA	Great Barrier Reef Catchment Area

Term / Acronym	Definition
km	kilometres
MD	Moderately Disturbed
Met	Meteorological
MV	Medium Voltage
MW	Megawatt
OHTL	Overhead Transmission Powerline
The Project	The Tully BESS Project
PSA	Particle Size Analysis
QLD	Queensland
RWQ	Reef Water Quality
RPEQ	Registered Professional Engineer of Queensland
RUSLE	Revised Universal Soil Loss Equation
SCL	Strategic Cropping Land
PESCP	Sediment and Erosion Management Plan
SPP	State Planning Policy
SSP	Shared Socioeconomic Pathway
TSS	Total Suspended Solids
WQIP	Water Quality Improvement Plan
WQO	Water Quality Objective

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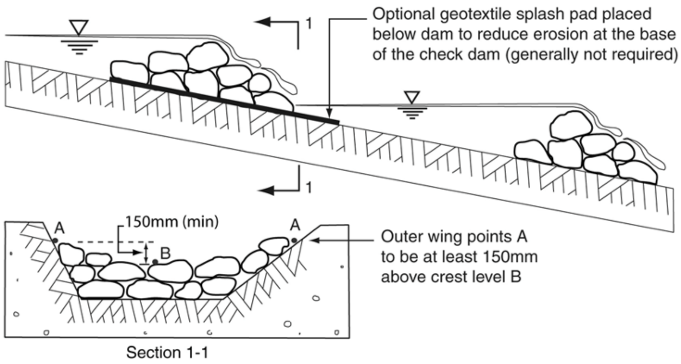
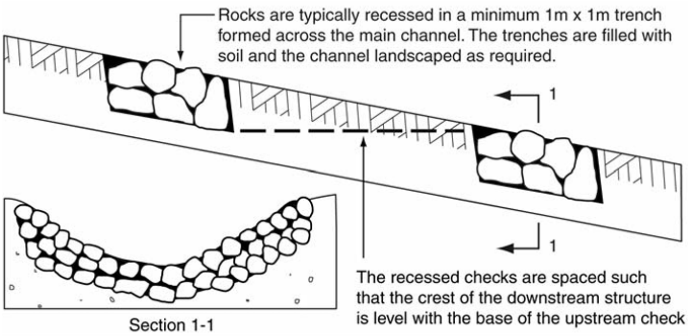
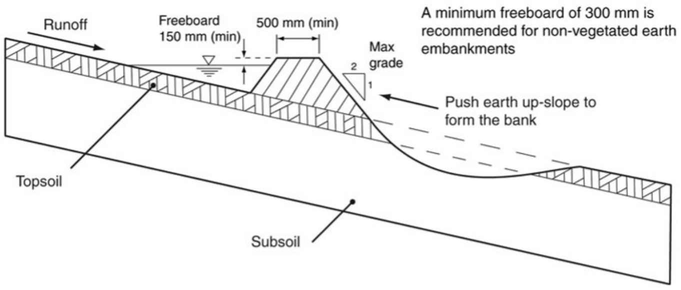
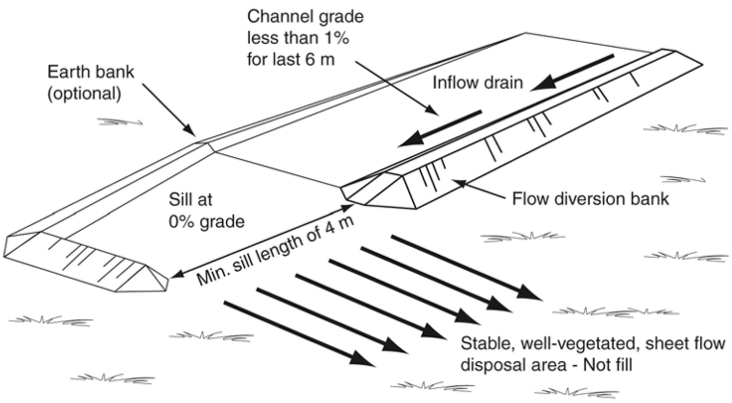
Appendix B

ESC Specifications

B-1 Drainage Controls

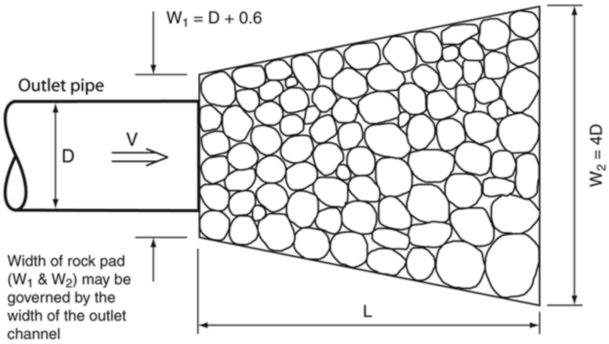
Table B.1: Drainage Control Specifications

Control	Example drawing
Rock check dams [28]	
Recessed rock check dams [29]	
Flow diversion bank – 'back-push bank' [30]	
Level spreader [31]	

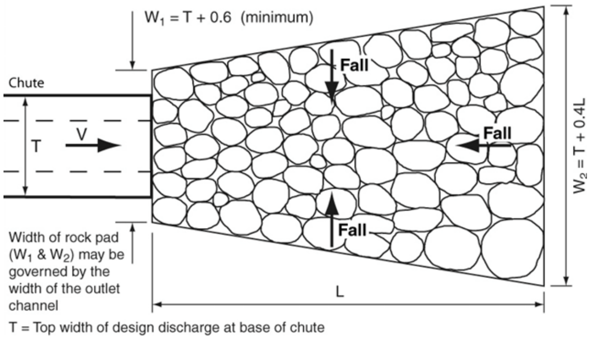
[28] As seen in: Catchments and Creeks Pty Ltd (2010) *Check Dams: Drainage control technique*, Figure 1 (pg. 3) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/314
[29] As seen in: Catchments and Creeks Pty Ltd (2020) *Check Dams: Drainage control technique*, Figure 4 (pg. 7) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/314
[30] As seen in: Catchments and Creeks Pty Ltd (2010) *Flow Diversion Banks Part 1: General Drainage Control Technique*, Figure 1 (pg. 3) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/301
[31] As seen in: Catchments and Creeks Pty Ltd (2010) *Level Spreaders: Drainage Control Technique*, Figure 2 (pg. 3) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/312

Control | **Example drawing**

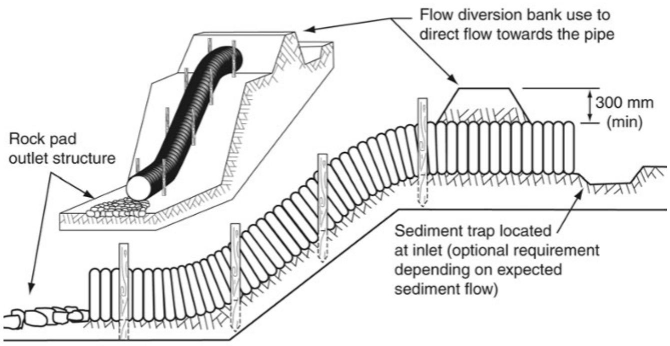
Outlet structure – single pipe rock outlet[32]



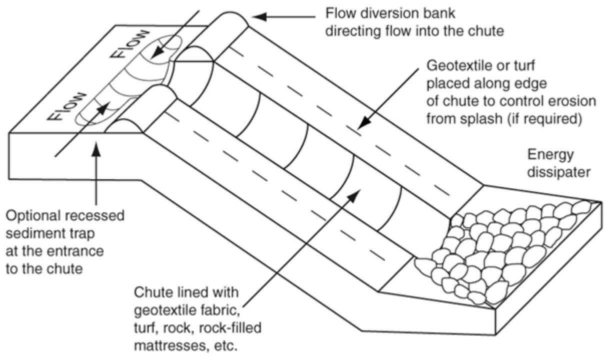
Outlet structure – recessed rock outlet for chute[33]



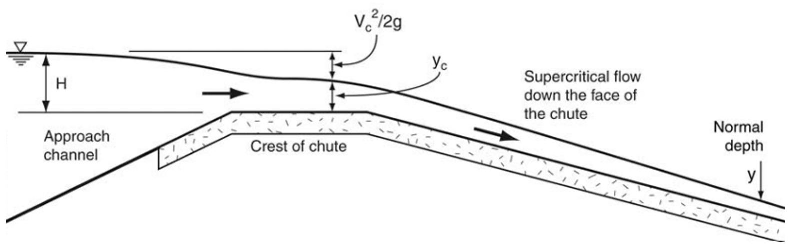
Slope drain – PVC pipe[34]



Chute[35]



[32] As seen in: Catchments and Creeks Pty Ltd (2010) *Outlet Structures: Drainage Control Technique*, Figure 1 (pg. 3) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/313
[33] As seen in: Catchments and Creeks Pty Ltd (2010) *Outlet Structures: Drainage Control Technique*, Figure 2 (pg. 4) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/313
[34] As seen in: Catchments and Creeks Pty Ltd (2010) *Slope Drains: Drainage Control Technique*, Figure 1 (pg. 4) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/317
[35] As seen in: Catchments and Creeks Pty Ltd (2010) *Chutes Part 1: General Information*: Drainage Control Technique, Figure 8 (pg. 8) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/296

<table>
<tr><th>Control</th><th>Example drawing</th></tr>
<tr><td>Chute – spillway outlet[36]</td><td>
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B-2 Sediment Controls

Table B.2: Sediment Control Specifications

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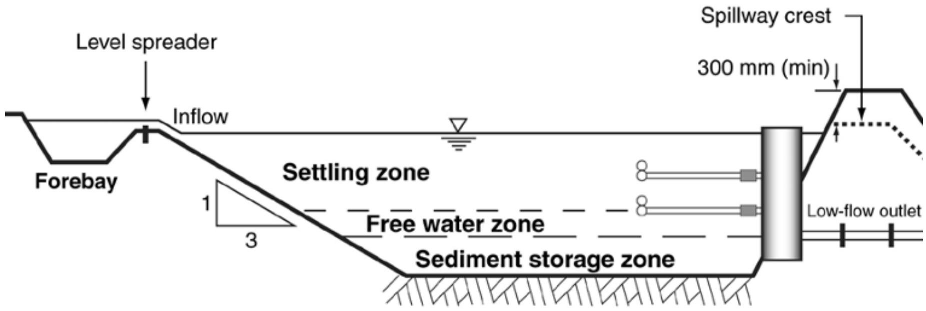
<tr><th>Control</th><th>Example drawing</th></tr>
<tr><td>Sediment Basin – Type A</td><td>
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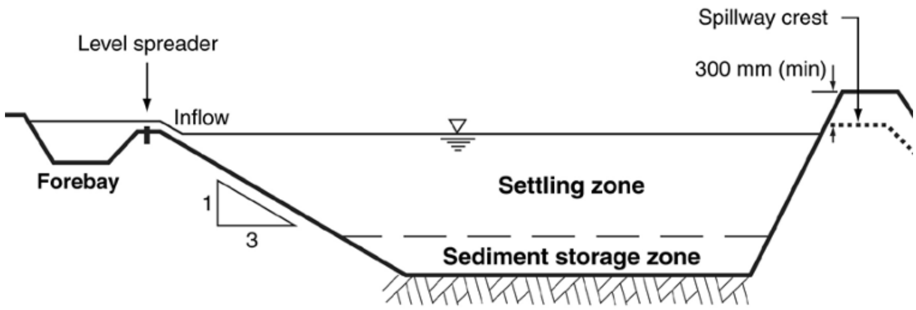
<tr><td>Sediment Basin – Type B</td><td>
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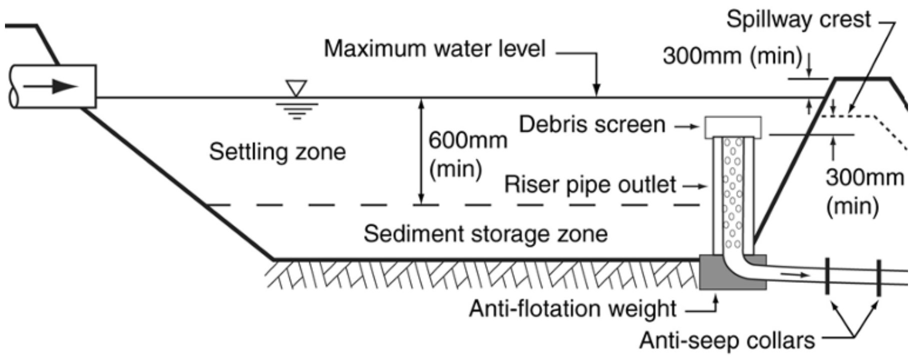
<tr><td>Sediment Basin – Type C</td><td>
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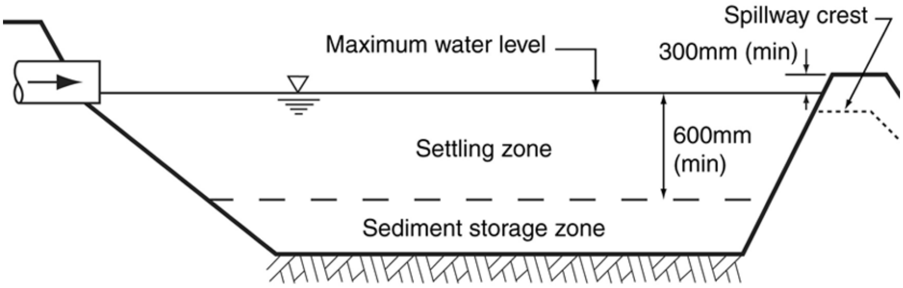
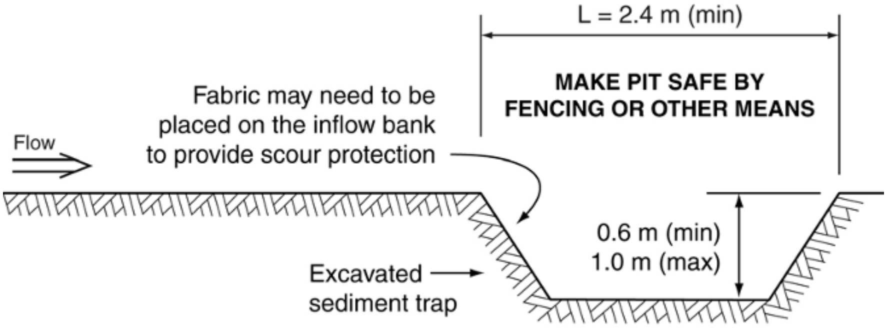
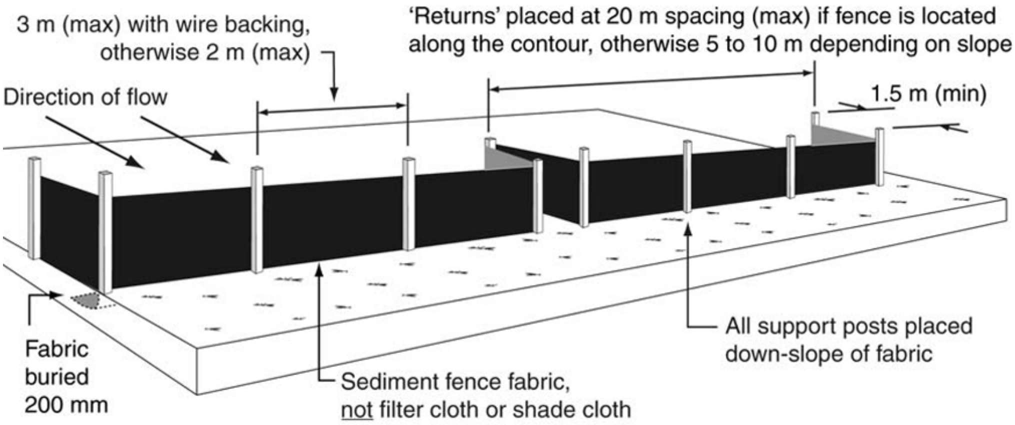
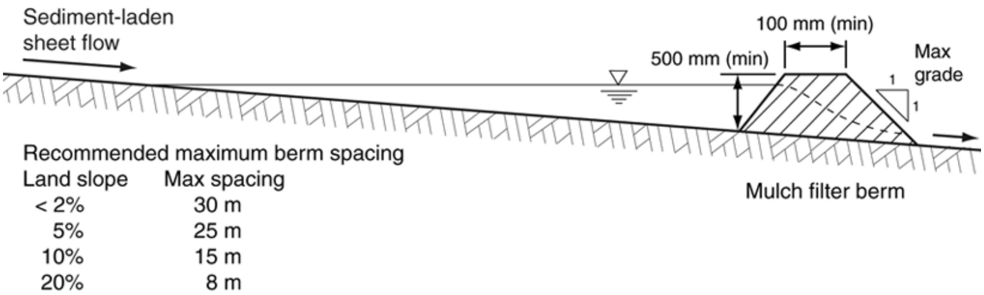
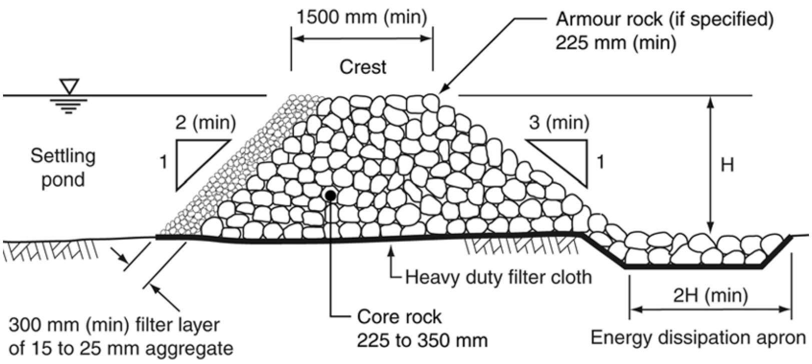
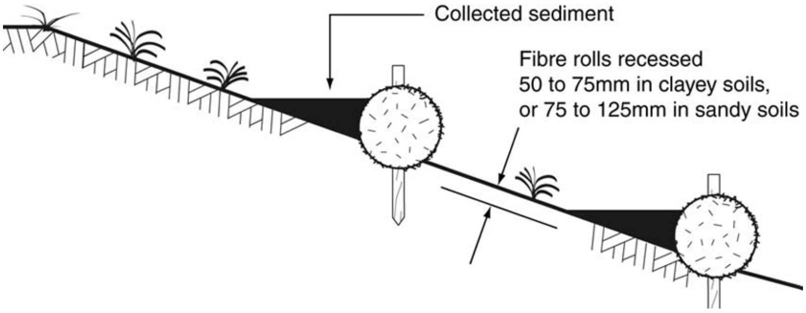
[36] As seen in: Catchments and Creeks Pty Ltd (2010) *Chutes Part 1: General Information*: Drainage Control Technique, Figure 1 (pg. 1) accessed 24/02/2025 at: https://www.austieca.com.au//documents/item/296

Control	Example drawing
Sediment Basin – Type D	
Excavated sediment trap	
Sediment fence	
Mulch filter berm	
Rock filter dam – aggregate filter	

Control	Example drawing
Fibre rolls	
U-shaped sediment trap – BU 'wide'