



Environmental Impact Statement

Sandhills Stormwater Management System Project

Prepared for Byron Shire Council
by Planit Consulting Pty Ltd

(v2.0) - December 2023
Job No: J6810

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(v1.0)	21/03/2023	RvI	LB	RvI
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Quality Assurance

This is to certify that the EIS:

- examines and takes into account all matters affecting or likely to affect the environment as a result of activities associated with the proposal;
- is accurate and does not omit any material information;
- concludes that, subject to the implementation of the safeguards identified in Section 6, it is unlikely that there will be any significant environmental impacts associated with the proposal; and
- requires Byron Shire Council to be responsible for undertaking the proposal as described, and implementing the safeguards as identified in the EIS, and managing construction risks.

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EIS Declaration

This Environmental Impact Statement:

- has been prepared in accordance with Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979*;
- has been prepared in accordance with Part 8, Division 5 of the *Environmental Planning and Assessment Regulation 2021*; and
- contains all available information that is relevant to the environmental assessment of the proposal.

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Proposed Development Sandhills Stormwater Management System Project

Address: Cowper Street, Byron Bay

Description: Construction of a stormwater management system including creation of a three-cell artificial wetland and associated works.

Environmental Impact Statement:

An environmental impact statement is provided addressing all matters in accordance with Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979*.

Certification: I certify that I have prepared the contents of this environmental impact statement in response to the Secretary's Environmental Assessment Requirements dated 1 September 2023 and the relevant provisions of Part 8 of the *Environmental Planning and Assessment Regulation 2021*.

To the best of my knowledge the information contained in the environmental impact statement is not false or misleading.

Signature:



Name: Rob van Iersel

Date: 08/12/2023

Executive Summary

Site:	Cowper Street, Byron Bay Lot 383 DP 728202 Part unmade Cowper Street road reserve
Current Zones:	Deferred Matter (BLEP 2014) 1(d) Investigation (BLEP 1988) 7(b) Coastal Habitat (BLEP 1988)
Land Owner:	Lot 383 – Crown Land Cowper Street – Council road reserve
Proposal:	The project includes the construction of a stormwater management system including: <ul style="list-style-type: none"> • three connected artificial wetland cells, including permanent open water zones and macrophyte zones, for stormwater management and water quality improvement; • a network of paths, providing access through the site and circulation around the wetlands; • seating nodes along the paths, designed to promote social gathering and passive recreation; and • associated works. Throughout this document and supporting documents the stormwater management system project is locally referred to as the 'Sandhills Wetlands Project'.
Proponent:	Byron Shire Council

Byron Shire Council proposes to upgrade the stormwater management system, including construction of wetlands on the site, to achieve a range of environmental objectives.

The objectives of the project include:

- Improve local stormwater quality, including at the stormwater outlet to Clarkes Beach;
- Improve flood storage to assist in mitigating flooding within the Byron Bay Town Centre;
- Acknowledge and protect Aboriginal cultural values of this landscape and deliver a design that is based on connecting with Country principles;
- Protect and enhance environmental and biodiversity values at the site;
- Reflect best practice water sensitive urban design;
- Improve visual and environmental amenity of the site;
- Provide an accessible pedestrian link to the future Arakwal Cultural Heritage Centre site;
- Provide an accessible open space recreational area that supports passive activation, social connection and community wellbeing; and
- Support delivery of key actions from the Byron Shire Council Memorandum of Understanding with Bundjalung of Byron Bay Aboriginal Corporation (Arakwal), Belongil Creek Floodplain Risk Management Plan (WBM BMT, 2015) and Byron Bay Town Centre Masterplan (Macgregor Coxall, 2015).

The Sandhills Crown Reserve is located directly to the east of the Byron Bay Town Centre. It is the largest undeveloped parcel of land in the town. It was subject to extensive sand mining in the 1950s and 1960s and is now flat and mostly vegetated.

A stormwater management system is proposed in eastern part of the Crown Reserve, including three wetland cells with a combined footprint of 1.2ha. Approximately 15,000m³ of material will be excavated to facilitate the wetlands.



Concept

The wetland cells will capture surface water flows from approximately 21ha of urban and urban fringe catchments, including flows from Lawson Street/ Lighthouse Road and Massinger Street. It is estimated that the wetlands will remove approximately 90% of sediment from the received stormwater flows and provide around 6,000m³ of additional flood storage.

Inlet flows from the existing stormwater infrastructure in these streets will flow into Wetland Cells 1 and 2 in the north-east. During storm events, flows will move through the wetland cells to discharge into an existing stormwater pit at the southern end of Cowper Street and then discharge via an existing outlet at Clarkes Beach.

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Pedestrian paths will be provided around the wetlands, connecting Massinger and Cowper Streets, with seating areas providing for improved passive recreation of the area.

The wetland cells have been designed to avoid direct impact on culturally important vegetation and ecological values, as much as possible. This has included adjusting the shape and outline of the wetland cells as well as minimising their footprint to greatest extent while achieving improved stormwater and flooding benefits.

The development will require the clearing of existing vegetation within the development footprint, including the clearing of threatened ecological communities. These residual or unavoidable impacts will be offset through biodiversity credits, calculated in accordance with the Biodiversity Offsets Scheme provisions and through replanting works associated with the construction.

The cells will be planted with an extensive range of native plants, which, as noted above, assist in removing sediment from surface flows before exiting the stormwater system. The planting of the wetland cells will also help to mitigate biodiversity impacts locally through the development of new macrophyte zones and additional wetland species. Landscaping around the new wetland cells will also incorporate species of trees that have unavoidably been removed, to assist with offsetting the loss of vegetation at the site.

Detrimental impacts through construction can be mitigated through the application of various environmental management plans, which will be collated into a Construction Environmental Management Plan to guide the works.

A detailed Cultural Heritage Assessment, undertaken in consultation with local Aboriginal representatives, was undertaken to determine the potential for works to impact on important local heritage.

That assessment resulted in a number of recommendations, including a recommendation for further site testing. That further testing was undertaken, again in consultation with local representatives, and resulted in the discovery of a number of objects, now in the care of Bundjalung of Byron Bay Aboriginal Corporation – Arakwal.

Read together, the *Cultural Heritage Assessment Report* and the *Test Excavation Report* (which is contained as Appendix E to the Cultural Heritage Assessment Report) indicate that the proposed works are unlikely to significantly impact on Cultural Heritage.

An operational Aboriginal Heritage Impact Permit (AHIP) will be required, under Part 6 of the *National Parks and Wildlife Act 1974* to confirm this conclusion.

Overall, the project will result in significant local benefits through respecting Aboriginal cultural heritage values, improvement in local stormwater quality (particularly at the Clarkes Beach outlet), provision of improved passive recreational use, and additional flood storage which will assist in easing local flooding in the Byron Bay Town Centre.

This EIS concludes that the works as proposed can be managed in a manner that avoids and/or mitigates significant environmental impacts.

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1 Introduction

1.1 Project Overview

This Environmental Impact Statement (EIS) has been prepared by Planit Consulting Pty Ltd on behalf of Byron Shire Council to assess the potential environmental impacts of the Sandhills Stormwater Management System, referred to locally as 'Sandhills Wetlands'.

The project primarily involves the construction of a stormwater management system including three connected artificial wetland cells to provide improved stormwater treatment and flood mitigation. Construction will require the excavation of approximately 15,000m³ of existing material, mostly sand, and the subsequent planting of a range of wetland plants.

Pedestrian pathways and seating areas will also be constructed.

The stormwater management system is permitted without consent pursuant to Clause 2.137(1) of *State Environmental Planning Policy (Transport and Infrastructure) 2021*. The pathway and seating area works are ancillary to the stormwater management system works but are also permitted without consent pursuant to Clause 2.73(3) of *State Environmental Planning Policy (Transport and Infrastructure) 2021*.

For the purposes of this work, Byron Shire Council is the proponent and determining authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This EIS has been prepared in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and Clauses 171, 190 and 192 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). The EIS enables Council to fulfil its obligations under Section 5.5 of the EP&A Act to examine and consider, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of that activity.

1.2 Project Objectives

The objectives of the project include to:

- Improve local stormwater quality, including at the stormwater outlet to Clarkes Beach;
- Improve flood storage to assist in mitigating flooding within the Byron Bay Town Centre;
- Acknowledge and protect Aboriginal cultural values of this landscape and deliver a design that is based on connecting with Country principles
- Protect and enhance environmental and biodiversity values at the site;
- Reflect best practice water sensitive urban design;
- Improve visual and environmental amenity of the site;
- Provide an accessible pedestrian link to the future Arakwal Cultural Heritage Centre site;
- Provide an accessible open space recreational area that supports passive activation, social connection and community wellbeing; and
- Support delivery of key actions from the Byron Shire Council Memorandum of Understanding with Bundjalung of Byron Bay Aboriginal Corporation (Arakwal), Belongil Creek Floodplain Risk Management Plan (WBM BMT, 2015) and Byron Bay Town Centre Masterplan (Macgregor Coxall, 2015).

1.3 Purpose of this Environmental Impact Statement

This environmental impact statement (EIS) has been prepared in accordance with Part 5 of the EP&A Act by Planit Consulting on behalf of Byron Shire Council.

The EIS provides the information required to assist Council, as the proponent and determining authority, to fulfil its duty to consider the environmental impacts of the project, in accordance with Section 5.5 of the Act.

Preliminary investigation of the proposal identified that the works are likely to significantly affect the environment. This EIS has therefore been provided, in accordance with Section 5.7 of the Act.

This EIS identifies and assesses the potential environmental, economic, and social impacts associated with the construction and operation of the proposed stormwater management system.

The EIS is intended to help the community, government agencies and the consent authority to make informed submissions and/or decisions on the merits of the project.

1.4 Structure of this Environmental Impact Statement

The structure and content of the EIS follows the requirements of Clauses 190 and 192 of the Regulation and addresses the Secretary's Environmental Assessment Requirements (SEARs) provided by the NSW Department of Planning, Industry and Environment on 1 September 2023.

A list of the SEARs and where they have been addressed in this EIS is provided in the table contained in **Appendix A**.

The EIS is structured as follows:

- **Chapter 1 Introduction** – introduces the project and structure of this EIS;
- **Chapter 2 The Site** – describes the subject site and its local and regional context;
- **Chapter 3 The Project** – provides a description of the project including key project definitions, key elements and indicative layout, and activities required for construction and operation;
- **Chapter 4 Planning Context** – provides an overview of relevant legislation and policy, outlining key requirements and compliance;
- **Chapter 5 Consultation and Identification of Issues** – outlines the consultation undertaken in the preparation of this EIS and how that has assisted in the identification of key issues for assessment;
- **Chapter 6 Environmental Assessment** – provides an assessment of the key environmental, economic and social issues for the project, their potential impacts and proposed management measures.
- **Chapter 7 Justification and Conclusions** – provides justification for the project based on the environmental assessment undertaken.

The EIS should be read in conjunction with the following specialist studies:

Supporting Specialist Studies		
1. Sandhills Wetland Detailed Design Package	Australian Wetlands Consulting	August 2023
2. Sandhills Wetland Detailed Design Report	Australian Wetlands Consulting	November 2023
3. Sandhills Wetland Basis of Design Report	Australian Wetlands Consulting	December 2021
4. Sandhills Wetland Response to SEARs	Australian Wetland Consulting	November 2023
5. Biodiversity Development Assessment Report (BDAR)	Planit Consulting	December 2023

6. Aboriginal Cultural Heritage Assessment. Stormwater Management System Project, Byron Bay NSW	Niche Environment and Heritage	December 2023
7. Historical Heritage Assessment. Sandhills Wetland Precinct, Byron Bay, NSW	Niche Environment and Heritage	December 2023
8. Construction Water Management Plan	ENV Solutions	December 2023
9. Acid Sulfate Soil Management Plan	ENV Solutions	December 2023
10. Construction Air Quality Impact Assessment	EMM	December 2023
11. Sandhills Stormwater Management System - Coastal Impact Assessment	BMT	November 2022
12. Sandhills Stormwater Management System Byron Bay - Flood Impact Assessment	BMT	December 2023
13. Detailed Site Investigation	ENV Solutions	November 2023
14. Construction Noise and Vibration Management Plan	Acousticworks	September 2022
15. Construction Traffic Management Plan	Planit Consulting	November 2022
16. Waste Management Plan	ENV Solutions	February 2023

2 The Site

2.1 Location and Context

The Sandhills Crown Reserve is located on the eastern edge of the Byron Bay Town Centre, as shown below in **Figure 2-1**.



Figure 2-1 | Site Context

This land was subject to intensive sand mining activities during the early 1960s, though since restoration has been left largely untouched, allowing regrowth of native vegetation communities and exotic species.

Sandhills is centrally located within the town of Byron Bay, generally bound by residential/ tourist development fronting Lawson Street to the north, by Massinger Street to the east, Middleton Street to the west and the Byron Bay recreation grounds, residential lots, an aged care facility, a child centre and a public hall to the south.

The Sandhills Estate also has frontages to Gilmore Crescent, Tennyson Street and Cowper Street, and is traversed by an unformed part of the Cowper Street road reserve.

The site is located directly across the road from Byron Bay's Clarks Beach. Land to the east is residential in nature with a mix of single dwellings, medium density development and tourist accommodation. To the south, part of the site also joins residential and aged care accommodation, but much of the southern boundary joins the Byron Bay recreation grounds, which contain several sporting fields and associated facilities. To the west, the site adjoins commercial uses and the Byron Central Business District.

The western part of the Sandhills Crown Reserve contains the Byron Bay Library, the recently constructed Jarjumirr Park, the Sandhills Early Childhood Centre and the Sandhills Youth Centre, access from Gilmore Crescent.

The proposed wetland development is located in the undeveloped eastern part of the Estate.

2.2 Site Description and Ownership

The proposed stormwater management system will be constructed within land known as Lot 383 DP728202, Cowper Street, Byron Bay and partly within the Council Cowper Street road reserve.

Lot 383 has an area of 5.22ha. It is an irregular shaped lot, with a frontage of 215m to Massinger Street on its eastern side. The northern boundary of 213m adjoins residential and tourist accommodation along the southern side of Lawson Street, with a western boundary of 239m to the Cowper Street Road Reserve (see **Figure 2-2**).

The Cowper Street road reserve contains a gravel pedestrian and maintenance vehicle access, which connects the sealed part of Cowper Street to the south, with Lawson Street to the north.

Lot 383 is owned by the Crown and is a reserve within the meaning of Part 5 of the *Crown Lands Act* 1989, managed by the Crown. Council will obtain a licence from the Crown Lands authorising the construction of the works.

Cowper Street is a Council road reserve.



Figure 2-2 | The Site

2.3 Land Use

Lot 383 is currently largely undeveloped, with a pedestrian access through Cowper Street, connecting to Lawson Street. Overland stormwater drainage and underground services (sewer, stormwater and recycled water main) traverse the lot.

2.4 Soils, Topography and landforms

The site is situated within the North Coast Bioregion, which covers northern NSW from the shoreline to the Great Escarpment. The topography of the wider region typically consists of the coastal sand barrier, through low foothills and ranges, to the steep slopes and gorges of the escarpment itself.

Lot 383 is within the Tyagarah aeolian (windblown) soil landscape, made of sandy soils originating from the adjacent beach ridge systems.

This low-lying soil landscape encompasses the majority of the site, with the south-eastern extent along Massinger Street characteristic of the erosional Billinudgel variant soil landscape (refer **Figure 2-3**).

Tyagarah (9540ty): Mapped over the majority of the site (shown orange in **Figure 2-3**).

Location: Sediment basins of mixed estuarine and aeolian origin within the inland margins of the Tweed-Byron Coast.

Geology: Quaternary estuarine alluvium overlain by and/or mixed with Quaternary (Pleistocene) sands. The sands are generally Aeolian, originating from the adjacent beach ridge systems.

Topography: Level to gently undulating plains. Watertables are generally within 100-200cm of the surface but can be higher in poorly drained areas. These are essentially the back barrier environment (Thom, 1984), a flat-lying sediment basin located inland of the inner barrier system. Within the back barrier zone sediments have accumulated from a number of processes, as listed below (summarised from Thom, 1984):

- Deposition by suspension from rivers
- Wash over sand deposition as extensive sheets which have been transported by storm surges across the shore zone and frontal dune ridges
- Aeolian reworking of exposed sand surfaces to produce back dune flats
- Channel-fill deposition of flood-tidal delta origin

Billinudgel variant a (9540bia): Small area mapped within the eastern corner (shown blue in **Figure 2-3**).

Location: Low hills on the metasediments of the Neranleigh-Fernvale Group. Occurs on the edges of the Burringbar Hills and on the flanks of the Alstonville Plateau. Also occurs as headlands at Cape Byron and Broken Head. Type location is the area of low hills surrounding Billinudgel and Ocean Shores.

Landscape: low rolling hills on metamorphics of the Neranleigh-Fernvale Group. Relief is 50-100 m, slopes 10-20% and locally >33%. Slopes are generally moderately long (100-300 m). Ridges and crests are narrow (100-150 m).

Geology: Neranleigh-Fernvale Group. Thinly bedded fissile shales, siltstones and sandstones with occasional more massive units such as greywacke, volcanic tuffs, agglomerates, sandstones and massive cobble conglomerates. These were previously known as the Fitzroy Beds.

Topography: Low rolling hills that abut the higher and steeper Burringbar (bu) soil landscape. Relief is 50-100 m and slopes range from 10-20%, with some localised steeper (>33%) areas. Elevation is 60-100 m. Slope length is generally moderate (200-300 m) and slope shape is simple and occasionally waning. Ridges and crests are narrow (100-150 m). Where this soil landscape meets the coast, seacliffs are common such as at Cape Byron and Broken Head. Streams are erosional, tributary and integrated.

Soil sampling undertaken for the project (ENV, 2023) showed that the soils within the development footprint are typically silty/ sandy clay and sand overlying sands.

Laboratory analysis of the soils, undertaken for the Acid Sulfate Soils Management Plan (ENV, 2023) indicated the presence of Actual Acid Sulfate Soils (AASS) and Potential Acid Sulfate Soils (PASS) material at the site. The soils contain levels of acidity in exceedance of relevant assessment criteria.

Surface soils typically comprised AASS sands with clay and silt inclusions overlaying a PASS clay stratum. Further detail is contained in the ASSMP (ENV, 2023).

A detailed site survey is contained at **Appendix B**. The site is generally flat with a slight fall from the north-west to the south-east. Levels at the corner of Lot 383 and the northern end of Cowper Street reserve are approx. RL 5.5mAHD, with levels in the south-east corner at approx. RL 3.00mAHD.

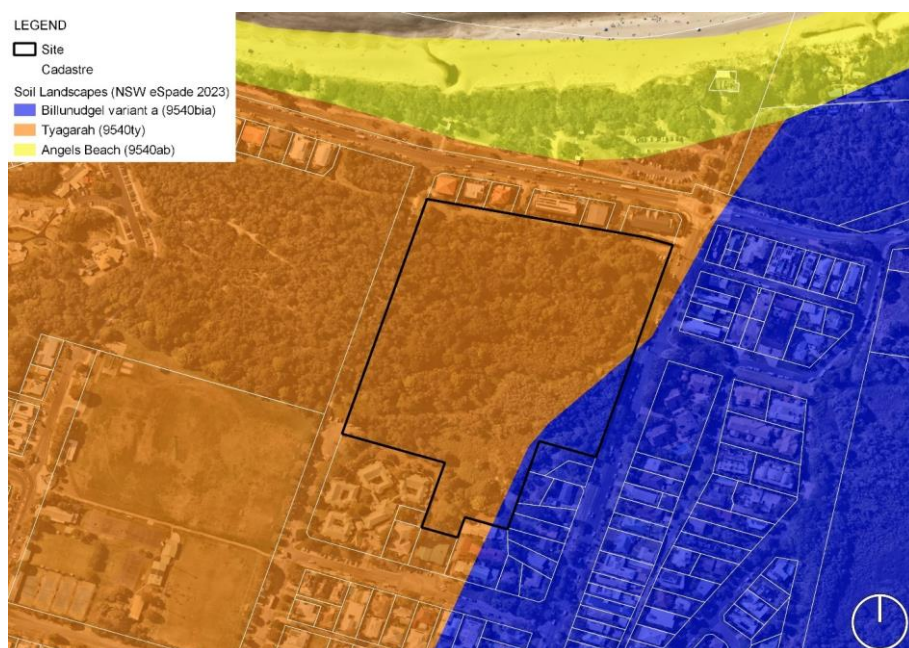


Figure 2-3 | Soil Landscape Mapping (source: eSpade, 2023)

2.5 Hydrology and Climate

2.5.1 Hydrology

Belongil Creek is the closest major watercourse, located approximately 2km to the west. Cumbebin Swamp (Cumbebin Swamp Nature Reserve) is approximately 1.2km to the southwest of the site and, the Byron Bay foreshore is approximately 150m to the north of the site.

The hydrology of the site is complex and has been highly altered. Currently, Sandhills receives piped stormwater flows from Arakwal National Park and Massinger Street in the east. A number of small surface swales direct flows from the south behind the residential properties and a pipe conveys flows from Lawson Street into a swale that drains from the north.

Piped flows enter into the existing drain from the south along Cowper Street and from the east behind the Byron Bay courthouse.

Existing surface drainage features are shown in **Figure 2-4**, with more detail in the site survey (**Appendix B**). Surface flows are generally from the north-east to the south-west, discharging into a

stormwater pit in the southern end of the Cowper Street road reserve. Pipes within this road reserve outlet only Clarkes Beach north of the site.

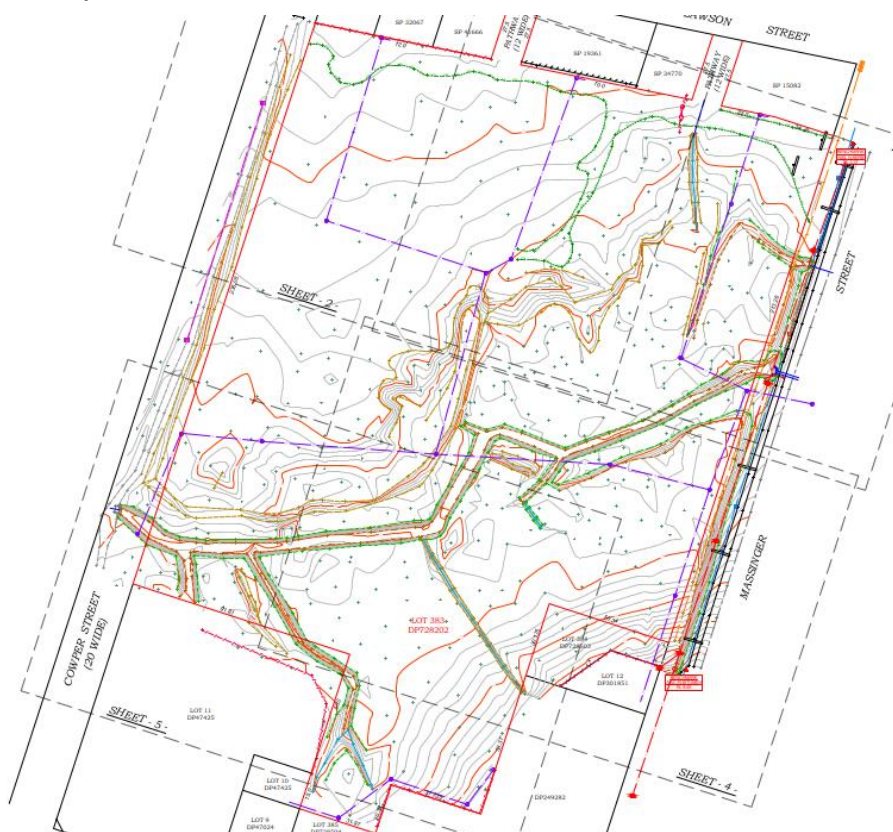


Figure 2-4 | Existing Surface Drainage Features (Source: Byron Bay Surveying, Aug 2021)

A total catchment of almost 60ha generates flows moving through the wider Sandhills Crown Reserve and out to Clarkes Beach. All flows enter a pit at the end of Cowper Street before discharging via a 1200mm diameter pipe to the Clarkes Beach outlet.

There is currently no formalised or managed treatment for any of the catchment.

The majority of flows passing through the Sandhills site are generated in the large urban catchment to the south. Table 2-1 describes the key catchments.

The largest flows and pollutants are likely to be generated by catchments to the south.

Table 2-1 | Local Drainage Catchments

Catchment	Description	Area (ha)
Lighthouse Road	A small mostly impervious area including portions of Lawson Street and Lighthouse Road. Flows enter Sandhills in the north east corner behind Lawson Street.	1.9

Catchment	Description	Area (ha)
Arakwal National Park	Large area of native vegetation. This catchment is unlikely to be generating high pollutant loads. Flows into the Sandhills site and traverses the existing surface drainage feature.	18.6
Southern Byron Township	Mostly impervious urban catchment. Flows are currently piped directly to the Clarkes Beach outlet.	34.6
Byron Bay CBD (library and courthouse)	A portion of the highly urbanised Byron Bay town centre drains to the east and is piped directly to the Clarkes Beach outlet.	3.9

2.5.2 Flooding

Flooding across the site is a result of local runoff flowing along the open drain within the property (BMT, 2023). Most flooding occurs to the south of the open drain. Peak flood levels are fairly consistent across the site, with a level of 3.17m for the 1% AEP, 3.09m for the 5% event, and 2.9m AHD for the 10% event. (BMT, 2023).

The limited capacity of the piped drain through Cowper Street and the outfall on Clarkes Beach causes significant flooding at the Byron Bay Recreation grounds and surrounding properties.

2.5.3 Climate

Byron Bay has a humid subtropical climate, with warm summers and mild winters. Winters have daily maximums usually reaching 19.4 °C and a minimum of 12 °C. Summer can be hot, with a daily average of 27 °C.

The wetter months are from October to May, with February usually being the wettest month. The drier season is from May to October, with August normally the driest month.

2.6 Vegetation

Council's Online Mapping shows the following vegetation communities as occurring within the site (see **Figure 2-5**):

- Coastal Dune Dry Sclerophyll Forest;
- Coastal Swamp Forest; and
- Coastal Heath Swamps.

A Biodiversity Development Assessment Report (BDAR) has been prepared in support of the proposed activity, describing and assessing vegetation communities across the whole of the Sandhills Estate.

As shown in **Figure 2-6**, plant communities were mapped across six (6) zones. The land subject to this proposed activity contains three plant communities in addition to a highly disturbed area dominated by exotic grassland.

The relevant communities are:

- PCT 751: Brush Box - Tuckeroo littoral rainforest on coastal headlands of the NSW North Coast Bioregion (Poor – Moderate Condition);
- PCT 1064: Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion (Poor – Moderate Condition); and
- PCT 1235: Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion (Poor – Moderate Condition).

The BDAR report contains a detailed description of these plant communities.

These vegetation communities are considered to be reflective of the following endangered ecological communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act):

- PCT 751 – Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- PCT 1064 – Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions
- PCT 1235 – Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregion

Two patches of PCT 1064 are considered to be reflective of the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1992* (EPBC Act) endangered ecological community known as Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland. Additionally, PCT 751 is considered to be reflective of the critically endangered Littoral Rainforest and Coastal Vine Thickets of Eastern Australia.

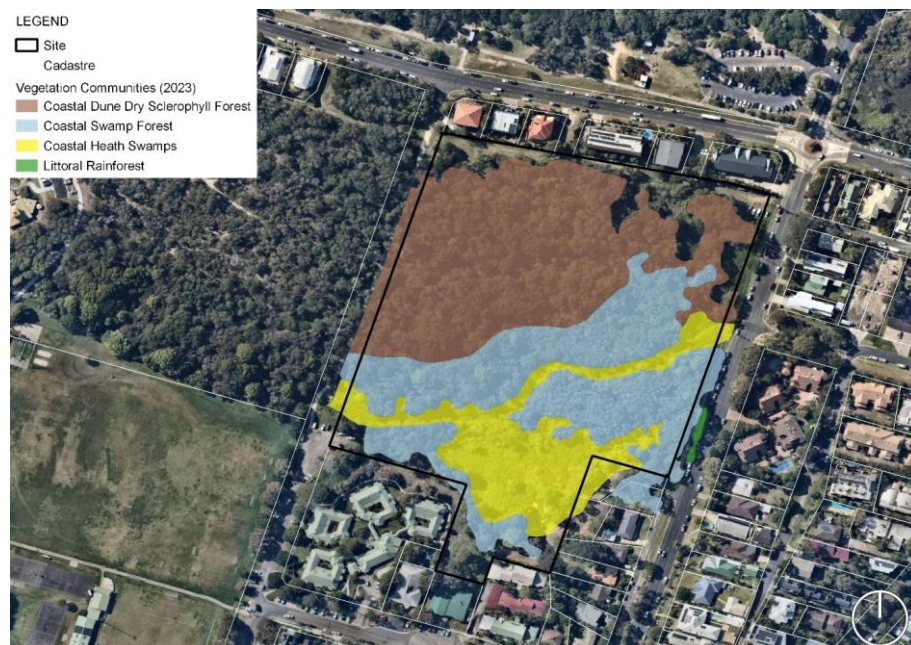
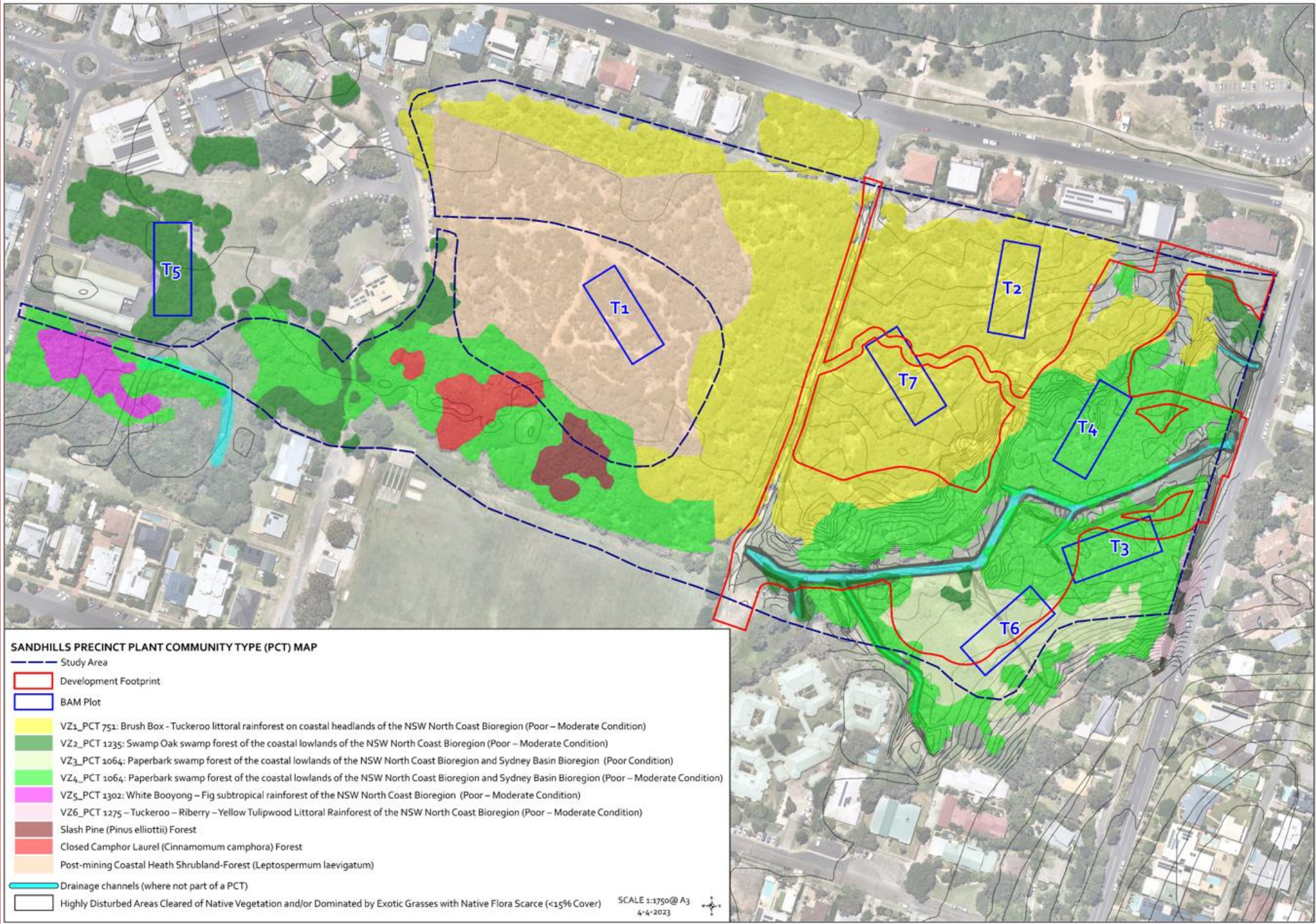


Figure 2-5 | Byron Shire Council Vegetation Mapping



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Figure 2-6 | Vegetation Communities

Vegetation mapped as littoral rainforest under *State Environmental Planning Policy (Resilience and Hazards) 2021* is located approximately 100m to the north-east, in the Clarkes Beach dune system. A small patch of Coastal Wetland is mapped adjacent to the site within the Massinger Street Road Reserve.

2.7 Fauna

2.7.1 Birds

The site contains habitat suitable for grassland/pasture birds, forest/woodland species (particularly those associated with closed canopy environments) and common generalist species typically found within modified habitats (i.e., magpies, crows etc.).

The presence of various interconnected and fragmented vegetation remnants on and adjacent to the site is likely the reason for the presence of a relatively diverse assemblage of avifauna. This corridor encompasses an altitudinal sequence of habitats rising from the drainage lines to rainforest over a short linear distance. Continuous habitat gradients such as this provide avifauna with a range of resources throughout the year and are likely to have importance in connecting breeding populations across the landscape.

Nectarivorous birds are reasonably well represented and generally well established within local paperbark and banksia forests. Meliphagids were regularly encountered with the most noted species being the Scarlet Honeyeater, Lewin's Honeyeater, Friarbirds and Lorikeets (Scaly-breasted and Rainbow).

Suitable habitat for species associated with dense ground strata was abundant throughout the eastern areas of the site, which contains dense ground layer of rushes/ sedges/ grasses/ weeds. A reasonable diversity of ground, low and shrub level birds were recorded from these areas, including Silvereyes, Scrub-wrens, Fantails and Fairy-wrens. These denser understorey components (including swards of rushes, grass trees and sedges) were also noted to be utilised by granivores such as finches (double-barred and red-browed).

The onsite presence and proximity of extensive coastal wetlands and drains has resulted in the recording of several waterfowl species, with standing water favouring smaller, dense ground strata refuge species such as rails. Open water species such as ducks, herons and egrets were also recorded within the site's drainage lines.

Diurnal coastal raptors were noted to be common in the locality and were recorded circling over the site (i.e., Brahminy Kite) although no nests were observed.

Two nocturnal species, the tawny frogmouth and barn owl, were recorded during nocturnal searches of the survey period. During the survey period, no trees within the survey area were considered to contain hollows suitable for large forest owl species. None were encountered during survey, which was considered to coincide with the typical breeding period of the Masked Owl, Sooty Owl and Powerful Owl per DEC (2005). It is noted, however, that a probable (very faint) Sooty Owl call was recorded on the acoustic recorded during survey efforts. As noted previously, given the absence of hollows, the site does not contain breeding habitat for this owl.

The presence of fruiting rainforest/riparian species has resulted in species list containing a high diversity of frugivores. Some fruiting eating species which also forage upon other resources (i.e. insects, seed and/or nectar) were also regularly recorded on site such as Doves, Pigeons and Cuckoo-shrikes.

In summary, the survey sites' physical features and resultant vegetation communities has produced a bird assemblage which is dominated by common sclerophyll forest/woodland species and species typical to low-lying swamps and rainforest which are abundant in the locality.

2.7.2 Mammals

A total of twenty-three (23) mammal species were recorded on the subject site, including four species listed as vulnerable under the *Biodiversity Conservation Act 2016*. A long-eared bat (*Nyctophilus* spp.) was recorded during anabat surveys. Three long-eared bat species are known from the locality, which

include the Gould's Long-eared Bat (*Nyctophilus gouldi*), the Lesser Long-eared Bat (*Nyctophilus geoffroyi*), and the vulnerable Eastern Long-eared Bat (*Nyctophilus bifax*).

Structural forest variation and/or dense understorey components suitable for ground-dwelling mammals were present over the forested areas of the site. Non-native species such as the house mouse, black rat, fox, cats and dogs were also recorded.

Significant open and grassed areas suitable for a variety of macropods are absent from the site, although the Swamp Wallaby was commonly noted sheltering on site during the day.

Hollow bearing trees (HBT) are absent, which resulted in the low abundance of hollow-dependent arboreal mammals.

Spotlighting, call playback and trace analysis efforts over the site resulted in the recording of Possums (short-eared, brushtail and ringtail). No evidence of Koala or gliders utilising the site was noted during the survey period.

Two species of flying fox (Grey-headed & Black-headed) were regularly recorded throughout the site, foraging on a variety of flowering and fruiting species (i.e., banksias, wattles, eucalypts etc.). A well-known roost camp occurs within proximity to the study area, immediately south of the Court House amongst Palm Forests and Swamp Oak. This roost is known as the 'Middleton Camp' (BSC, 2017).

It is considered that the site and surrounds contain a variety of suitable foraging spaces for microchiropteran bats (i.e., the turfed and cleared areas (i.e., sporting fields to the south), provide 'uncluttered open space'; the forest fringes provide 'edge' space, the lower canopy zone of the forest patches provides 'cluttered' space; constructed drains provide 'over water surfaces space'. Numerous security lights, street lights and floodlights within the locality also provide additional micro-bat activity areas associated with increased insect activity.

The bats recorded within the site require tree cavities for roosting/breeding and as shelter, maternity places and retreats for hibernation. The availability of suitable roosts is therefore critical for the survival of forest bats. Tree hollows and cavities are not present within the development site. Palm fronds, which are suitable for species such as the Eastern Long-eared Bat, are however present in association with the Palm Forests within the site.

2.7.3 Reptiles

A total of eight (8) reptile species were recorded on the subject site. No species listed as endangered or vulnerable under the *Biodiversity Conservation Act 2016* were recorded during fauna survey works.

The majority of individuals were encountered within the deep leaf litter layer and exposed layers adjacent to the drainage lines of the site which provide a high diversity of microhabitats within the lower layers.

2.7.4 Amphibians

Eight (8) species of native frog and one (1) introduced toad were recorded on the subject site. One frog scheduled as vulnerable under the *Biodiversity Conservation Act 2016* was recorded during fauna survey works.

The cane toad was recorded on several occasions throughout the site. The balance of the frog species is considered common and/or generalist species with the shallowly ponded areas within swamp sclerophyll forests containing sedges/rushes and drainage lines, suitable for amphibians during ponding periods.

The vulnerable Wallum Froglet was heard vocalizing on numerous occasions within the southwestern drainage line.

2.7.5 Fish

The site is not mapped as key fish habitat, and it is considered unlikely that the drainage lines through the site would provide habitat to support any fish species.

2.8 Cultural Heritage

The traditional custodians of the wider area are the Arakwal people, who are one of the groups of the Bundjalung Nation, whose traditional country is recorded to have extended along the east coast, between the Clarence River in NSW and the Albert River region in southern Queensland (QLD) and west to the Great Dividing Range (Niche, 2023).

The Bundjalung's long connection to the land is evident, with the known occupation period being 5,000-6,000 years. The Bundjalung Nation encompasses the whole language area, including the Arakwal, Minyungbal, Ngnadowal, Coodjingburra, Tulgigin, Moorang-Moobar and Gidhabal People, (variously called Minjangbal, Minjyung, Minywoa, Gendo, Gando Minjang, Gandowal, Ngandowul, Cudgingberr, Coodjingburra, Githabal and other alternatives).

According to ethno-historical research conducted in south-east Queensland, the extended family formed the basic socio-economic unit of traditional Aboriginal life (Collins 1991: 21). Groups of people formed what is ethnographically termed as 'clans'. These groups or clans, co-operated interconnectedly, managing social, resource and, economic demands (Collins 1991: 21).

Within the resource-rich coastal areas of northern NSW, clans with populations of at least 100 members occupied reasonably small territories, the boundaries of which were defined, generally known, and clearly established in songline (Creamer 1974 in Collins 1991: 21). The clans occupying the area would occasionally converge with other clans for trade, hunt, flight, feast, arrange marriages, conduct ceremonies, resolve disputes, and share information. The social organisation between clan groups is complex, with blended boundaries, dialect, descent, history, and a shared 'Dreaming' ancestor, with each group led by influential individuals.

Prior to colonisation, resource use and people movements were determined in large part by seasonal resource availability and social customs. Coastal clans relied heavily on marine resources, particularly fresh and saltwater fish, shellfish, and crustaceans, particularly along the banks and in the catchments, estuarine outlets and wetlands of the Tweed, Brunswick, Richmond, and Clarence Rivers. Often terrestrial animals were hunted to supplement diets, including flying foxes, pademelons, possums, wallabies, koalas, bandicoots, goannas, carpet snakes, birds, eggs, and wood grubs (Collins 2010:21).

Prior to the extensive sand mining undertaken across the Sandhills site, it is expected that it would have been dominated by tall open and closed forest (swamp communities). It is located close to the coastal shore and the two drainage lines through the estate would have provided abundant resources utilised and managed by past Aboriginal people. Concentrated and repeated occupation may be represented in areas such as this that have reliable access to water and foods sources.

The most significant cultural features that have been identified in the vicinity are approximately 250m east of the site and include burial sites, middens and known ceremonial areas, which form an important component of the cultural landscape of the region (Niche, 2023).

The land and waters of the local area have been used for thousands of years for the hunting and gathering of food, fishing, and the continuation of cultural, spiritual, and sacred activities. Aboriginal cultural connections have always been strong in this area and continue today, as it is still a well-utilised fishing and recreational area used by Traditional Owners.

3 The Proposal

3.1 Summary

Byron Shire Council (BSC) seeks to construct a stormwater management system within and around existing drainage features in the eastern portion of the Sandhills Crown Reserve. The installation of the wetlands will increase the amount of water stored at the site, improve stormwater quality treatment, and slow the movement of water to Clarkes Beach following rainfall events.

The objectives of the project include to:

- Improve local stormwater quality, including at the stormwater outlet to Clarkes Beach;
- Improve flood storage to assist in mitigating flooding within the Byron Bay Town Centre;
- Acknowledge and protect Aboriginal cultural values of this landscape and deliver a design that is based on connecting with Country principles
- Protect and enhance environmental and biodiversity values at the site;
- Reflect best practice water sensitive urban design;
- Improve visual and environmental amenity of the site;
- Provide an accessible pedestrian link to the future Arakwal Cultural Heritage Centre site;
- Provide an accessible open space recreational area that supports passive activation, social connection and community wellbeing; and
- Support delivery of key actions from the Byron Shire Council Memorandum of Understanding with Bundjalung of Byron Bay Aboriginal Corporation (Arakwal), Belongil Creek Floodplain Risk Management Plan (WBM BMT, 2015) and Byron Bay Town Centre Masterplan (Macgregor Coxall, 2015).

3.2 The Proposal

The scope of works for the proposal includes the establishment of a stormwater management system, including (refer to **Figure 3-1**):

- a series of three interconnected artificial wetland cells, including two permanent open water zones, for stormwater management and water quality improvement;
- formal entry and circulation paths; and
- secondary informal gravel access paths.

The establishment of the wetlands will require the excavation, treatment, and removal of approximately 15,000m³ of soil, and associated vegetation removal.

The wetland design is shown in detail in the *Sandhills Wetland Detailed Design Package* (AWC, 2023) and described in more detail in *Sandhills Wetland Detailed Design Report* (AWC, 2023).



Figure 3-1 | Concept Plan

3.2.1 Design

The design includes three wetland cells with a combined footprint of 1.2ha, which will capture flows from approximately 21ha of urban and urban fringe catchments, including flows from Lawson Street / Lighthouse Road and Massinger Street. Inlet flows from the existing stormwater infrastructure in these streets will flow into Wetland Cells W1 and W2, with flows from Lawson Street into Cell W1 and flows from Massinger Street into Cell W2.

Flows will move through the wetland cells to discharge from Cell W3 into the existing stormwater pit at the southern end of Cowper Street and then discharge via the existing outlet at Clarkes Beach.

Sediment basins have not been provided within the Sandhills system to reduce maintenance requirements and enhance aesthetics. The flow path from Massinger Street is conveyed via a detention basin on Patterson Street. As the surrounding soils are sandy, the majority of the sediment is coarse, heavy and therefore likely to settle out within that detention basin prior to entering the wetland.

Flows conveyed from the north will enter a vegetated swale prior to being conveyed to wetland Cell W1. Coarse sediments and gross pollutants will be deposited within the swale.

The wetland has been designed to support a range of wetland habitats and wetland vegetation complexes. To achieve this, varying water depths have been provided. Cell W1 is the deepest, with 300mm of standing water during and following rainfall events and an extended detention depth of 300mm.

Cell W2 is shallower, with an operating water depth of 200mm and an extended detention depth of 200mm.

Cell W3 will have just 100mm of standing water and no extended detention depth, except when the outlet flow is restricted.

Cell W3 is designed to draw down to a low-level following rainfall. This will occur provided that the outlet at Clarkes Beach is not restricted by sand accumulation on the beach front.

Deeper zones have been provided to support aquatic biota in the wetland system. Deep zones (up to 1.5m deep) are provided in cells W2 and W3. These deep zones will provide refuge between rain events for fish, frogs and aquatic invertebrates. Access to open water zones will be restricted by dense planting around the deeper water edge. The deep zones will be lined with an impermeable lining to prohibit interaction with groundwater. Small open water zones have been provided at spillways to facilitate maintenance.

Existing infrastructure will be used at the inlets of Cells W1 and W2 to convey flows to the wetlands. The outlet structures of Cells W1 and W2 have been sized to provide a 24-hour detention time ($\pm 10\%$) within the wetland with weirs to convey the 10-year ARI flow safely through the system.

Three weirs have been included in the system. Weirs between Cells W1 to W2 and Cells W2 to W3 are trafficable and have been sized to convey the 10 year ARI flow across the wetland to the outlet. Cell W3 has a weir and rock lined channel, which conveys flows to the existing system outfall pipe. Cell W3 has no extended detention volume or low flow outlet.

MUSIC modelling undertaken by the project designers (AWC) show that water levels will be above the wetland soil substrate in Wetland Cells 1 and 2 most of the time. This due to the design water depth in these cells being intentionally deeper to support the selected wetland plant communities within these wetlands.

Wetland Cell 3 is intended to be more ephemeral and will feature some wetland forest plantings. The weir heights and extended detention depths are set lower to provide the appropriate hydrology for these communities. Wetland Cell 3 will also have periods where there is no standing water present as would typically be seen in natural wetland systems (AWC, 2023).

3.2.2 Groundwater

The wetland designers (AWC) have undertaken a detailed investigation of the groundwater at the site to ensure that the installation of the wetland cells will not result in negative groundwater impacts.

Groundwater levels were monitored at the site over a 10-month period in 2022 (AWC, 2023). Monitoring indicates that groundwater levels fluctuate in response to rainfall events and when the Clarkes Beach outlet is covered by sand.

The design of the wetland cells ensures that base levels are above recorded groundwater levels and above the level set by the system outlet, to ensure that there is storage available for flood flows and to reduce the impact on local water tables and associated groundwater dependent vegetation.

The following table indicates the design wetland floor levels in relation to the groundwater levels measured in AWC's monitoring bores.

Table 3-1 | Groundwater Levels (source: AWC, 2023)

Borehole	Existing Surface Level (mAHD)	Groundwater Level (mAHD)	Wetland Design Floor Level (m AHD)
1	3.30	1.50	1.8

Borehole	Existing Surface Level (mAHD)	Groundwater Level (mAHD)	Wetland Design Floor Level (m AHD)
2	4.49	2.04	2.6
3	2.75	0.75	2.6
4	2.74	1.75	2.0
5	2.68	1.18	1.8
6	2.95	1.45	1.8

3.2.3 Ecological Function

The design aims to enhance and regenerate existing site vegetation and habitat at the site, including wetland forest communities, wet heath and frog habitat. Plant species have been selected to reflect local ecological communities and the frog habitat identified on the site and to be consistent with occur in the retained habitat.

Key plant species within the frog habitat include Tassel Cord Rush (*Baloskion tetraphyllum*), Beak Rush (*Rhynchospora brownii*) and Woolly Frogmouth (*Phylidrum lanuginosum*), which are already present on the site.

Consideration of planting design around open water will restrict access to open water for cane toads. Deep zones play an important role in supporting aquatic biota on the site, particularly between rainfall events.

Specific consideration has been given to the groundwater dependent vegetation on the site. Design levels have been set to prevent significant lowering of local groundwater levels. Monitoring has been undertaken to understand the variability of groundwater levels and interaction with site vegetation.

The design intent is to ensure that wetland vegetation can be supported by periodic interaction with the groundwater table.

Wetland planting will provide further filtering of water in the cells. The macrophyte zones of the cells will be unlined, allowing a portion of the stormwater that flows into the cells to infiltrate into the soils.

MUSIC modelling undertaken (AWC, 2021) indicates that the wetland will provide high levels of treatment for stormwater flows (see Table 3-1).

Table 3-2 | MUSIC Model Results (Source: AWC, 2021)

Parameter	% Reduction	BSC DCP Required Reduction (%)
Total Suspended Solids (kg/yr)	71.6	NA
Total Phosphorous (kg/yr)	66.0	80
Total Nitrogen (kg/yr)	52.1	40
Gross Pollutants	100.0	NA

3.2.4 Flood Storage

In terms of flooding, the design intent is to capture and release rainfall events while allowing for the safe conveyance of larger events. The proposed wetland provides a flood storage volume of

approximately 6,000m³, which will assist in reducing flood peaks within the adjacent Byron Bay Town Centre.

The proposed wetlands result in a decrease in flood levels and extent outside of the site boundary for events up to and including the 1% AEP design flood event. For events up to and including the 10% AEP design flood event, the decrease in peak flood levels occurs between Cowper and Tennyson Streets and in the overland flow path to the east of the site. In events between the 5% and 1% AEP design flood events, the decrease in flood level also extends between Tennyson and Fletcher Streets. The PMF event overall shows no change in peak flood levels off site (BMT, 2023).

Table 3-3 | Change in Peak Flood Levels Onsite (BMT, 2023)

Event	Existing (mAHD)	Post-Development (mAHD)
1% AEP	3.17	3.11
5% AEP	3.09	2.99
10% AEP	2.90	2.78

The wetland will allow flows to spread out and reduce upstream impacts. The invert of all existing stormwater pipes has been considered and cell floors and operating water levels are all below incoming pipes to prevent any impacts on upstream properties.

Hydraulic control structures, in the form of accessible riser outlets, will be incorporated between the cells to restrict flows between the cells to allow the water to "sit" within the cells to maximise water quality improvements. Weirs are located between Cells W1 and W2, which will convey flood flows up to the Q100 yr storm.

3.2.5 Pathways and Seating

Proposed pathways and seating areas are shown in the attached plan set and include reinforced concrete paths and decomposed granite sand paths. Paths will connect and allow circulation between Massinger Street and Cowper Street.

A number of seating nodes will be constructed, allowing passive recreation and enjoyment of the wetland aesthetics.

3.3 Generalised Construction Methodology

The works will ideally be scheduled for the Byron Bay dry season, which is generally between May and December. Construction is likely to commence with the downgradient cell (Cell W3) and progress upgradient, finishing with the construction of the uppermost cell (Cell W1).

The following construction methodology has been provided by Australian Wetlands Consulting as part of the Detailed Design Package (AWC, 2023).

3.3.1 Clearing and Grubbing

The proposal will result in direct impacts on approximately 2.077ha of native vegetation, comprising 'PCT 751: Brush Box - Tuckeroo littoral rainforest on coastal headlands of the NSW North Coast Bioregion', 'PCT 1235: Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion'; and 'PCT 1064: Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion', and approximately 0.6ha of disturbed/ degraded grassland.

While eleven (11) Stinking Cryptocarya (*Cryptocarya foetida*) individual trees are required to be removed, the proposal has avoided thirty-two (32) others occurring within the study area and, consistent with Connecting with Country design principles, the proposal has avoided certain trees at the request of representatives of the Bundjalung of Byron Bay Aboriginal Corporation, Arakwal.

The proposal also includes the planting of Stinking Cryptocarya as a part of the landscape works, which will ensure that there is no net loss of this species within the site.

Areas/ trees required to be cleared will be clearly delineated/ tagged prior to works commencing, in accordance with Australian Standard 4970-2009 *Protection of Trees*. Areas of exclusion will remain adequately marked until the conclusion of construction activities. Site personnel, including contractors, will be made aware of the extent of any authorised area in which they will be working.

Trees to be removed and works within the drainage lines will be inspected for fauna by a suitably qualified ecologist/ wildlife spotter catcher immediately prior to the commencement of clearing works. Any fauna detected within proposed clearing areas will be relocated to adjacent habitat outside of the works footprint. The ecologist/ wildlife spotter catcher will supervise all clearing works.

Further detail on clearing works, and a detailed assessment of impacts, is included in the BDAR report submitted in support of this EIS.

Clearing and grubbing will include the removal and disposal of organic materials including tree stumps, roots, rubbish and building debris within the specified area. Appropriate sediment and erosion controls will be installed prior to commencement of the works.

The area to be cleared and grubbed will be the footprint of the works. All vegetation other than exotic weeds will be mulched / chipped to be reused on site.

Clearing will follow the sequence below:

- Pre-clearing tree survey – identify and locate extent of works and all trees to be removed and retained;
- Fauna clearance – capture and relocate fauna in the trees to be removed, undertaken by a suitably qualified ecologist/ fauna catcher;
- Tree clearing – removal of nominated trees, stockpiled for re-use within site works;
- Weed removal – to be treated and disposed of at an approved waste facility; and
- Rubbish and debris removal – removal from within the works area and disposal at an approved waste facility.

3.3.2 Bulk Earthworks

Topsoil strip and Stockpile

Stripping and stockpiling of topsoil will include the removal of organic material and topsoil within the works footprint as per the supplied drawings.

The area of topsoil to be removed shall be the footprint of the works. Removed material shall be disposed of or stored for reuse in a location separate to subgrade and unsuitable material, as determined by the Project Superintendent.

Removal and replacement of unsuitable material

Removal and replacement of unsuitable material will include excavation and disposal of materials nominated or deemed as unsuitable by the Superintendent. Excavated materials will be treated in accordance with the Acid Sulfate Soils Management Plan and placed in a location approved by the Superintendent.

As outlined in the Acid Sulfate Soils Management Plan (ENV, 2023), there are two options for the treatment of excavated material:

1. In-situ mixing during excavation, where aglime is progressively added to in-situ soils in 0.3m layers and mixed prior to excavation, at mixing rates specified in the Management Plan; or
2. On-pad treatment, where untreated soil is excavated directly onto a suitably designed and prepared treatment pad where aglime is added at the specified rates.

The contractor will determine the most appropriate treatment option or combination of the two. Any treatment pad would be located directly adjacent to the excavation area, within the clearing footprint, to avoid additional vegetation impacts.

Treated material will be transported off-site to an approved location.

3.3.3 Wetland Construction

Excavation of Drains

Drainage works will be constructed in parallel with other operations. Drains will be excavated and trimmed to reflect the design detailed in the project drawings.

Supply and Install Geofabric

Geofabric will be installed in areas specified in the design documentation. This lining is used in the deep water zones to ensure that the ponds do not interact with groundwater. Joining of geofabric material will be conducted in accordance with the manufacturers specifications with overlaps adjusted to suit the subgrade strength. Backfill material will be placed and compacted to the finished surface level.

Supply and Install Rock Protection

Rock protection will be installed in areas specified in the design documentation and installed to depths nominated. Placement methods must ensure that the rock protection can perform its intended purpose and will be approved by the Project Superintendent prior to commencement.

3.3.4 Planting / Landscaping

Planting of the wetland cells and work area will be carried out in accordance with the design plans, and the associated Landscape Planting Schedule (Plan No. 1-T91194_DD_500). This includes:

- macrophyte planting of aquatic plants, such as Jointed Rush (*Baumea articulata*), Spike Rush (*Eleocharis dulcis*), and Grey Sedge (*Lepironia articulata*);
- shrubs and grasses, including Swamp Banksia (*Banksia robur*), Swamp lily (*Crinum pendunculatum*), and Salt Marsh Rus (*Juncus usitatus*);
- terrestrial plantings, including Coastal Banksia (*Banksia integrifolia*), Stinking Cryptocarya (*Cryptocarya foetida*), Swamp Box (*Lophostomen suaveolens*), and Broad-leaved Paperbark (*Melaleuca quinquinervia*).

4 Planning Context

4.1 Strategic Context

4.1.1 North Coast Regional Plan 2041

The design and construction of the stormwater management system and ancillary works is consistent with a number of goals and objectives outlined in the Plan, including:

- Goal 1 Liveable, sustainable and resilient
 - Objective 3: Protect regional biodiversity and areas of high environmental value
 - Objective 4: Understand, celebrate, and integrate Aboriginal culture
 - Objective 5: Manage and improve resilience to shocks and stresses, natural hazards and climate change
- Goal 3 Growth change and opportunity
 - Objective 19: Public spaces and green infrastructure support connected and healthy communities.

4.1.2 Byron Shire Local Strategic Planning Statement (LSPS, 2020)

The wetland project is consistent with the following Themes and Key Priorities of the LSPS, 2020:

- A Sustainable Shire
 - SP1. Protect and enhance our biodiversity, ecosystems and ecology
 - SP3. Adapt to climate change and building resilience
- A Connected Shire
 - CP4. Provide essential services and reliable infrastructure which meet an acceptable community standard.

4.1.3 Arakwal Memorandum of Understanding

Byron Shire Council has had agreements in place to work with the Bundjalung of Byron Bay Arakwal People since the late 1990's. The purpose of this agreement is to establish a clear process and timetable for the delivery of priority projects identified in this MOU and to build on the existing relationship between Council and Arakwal People.

The Arakwal Memorandum of Understanding 2019-2021 Implementation Plan includes an action for Arakwal and Council to work in partnership in relation to the Sandhills Estate, including work on:

- Establishing a protocol for works within the Sandhills precinct;
- Regeneration and improvement of the wetlands;
- Improving outcomes from drainage issues associated with the site;
- Culturally based interpretive signage;
- Pedestrian link to proposed Arakwal cultural centre; and
- Improved civic and community outcomes.

Arakwal representatives have been involved in design and delivery of the recently completed Jarjumirr Park project located to the west on part of the Sandhills Crown Reserve and in the development of the design and the Cultural Heritage Assessment for this project. Representatives of Arakwal and Tweed Byron Local Aboriginal Lands Council will continue to be involved, particularly in progressing the detailed design of individual Indigenous-inspired design elements, cultural interpretation opportunities and cultural language use and in cultural heritage preservation during construction works.

4.1.4 Byron Bay Town Centre Masterplan

The wetland project is a response to this Masterplan, including:

- the “Natural Environment Strategy”, which includes key findings, including:
 - Ponds and wetlands should be used to mitigate flooding; and
 - Establish a stormwater detention zone through wetland treatments within the Sandhills Scrubland Walk.

The Masterplan notes that community *“feedback was focussed on ecological solutions which can also improve biodiversity, habitat, amenity, recreation and education opportunities”*.

- The “Open Space Circuit Strategy”, which includes establishing safe pedestrian movement links connecting the key parts of Byron Bay, including through a Sandhills Scrubland Walk.
- The “Centre for Creativity Strategy” with actions to provide an interactive journey through the site using Aboriginal art and cultural interpretation.

4.1.5 Belongil Creek Floodplain Risk Management Plan

The Management Plan outlines a range of flood mitigation measures for Byron Bay, including a “Preferred Byron Drainage Strategy”. That strategy includes a range of measures to be implemented within and around the Byron Bay Town Centre and includes the construction of a wetland detention basin in the Cowper Street area.

The subject project has been developed directly in accordance with this preferred drainage strategy.

4.2 Statutory Context

4.2.1 Land Use Definition

The proposed works are defined as **stormwater management system** in accordance with clause 2.136 of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP), which means:

- (a) *works for the collection, detention, harvesting, distribution or discharge of stormwater (such as channels, aqueducts, pipes, drainage works, embankments, detention basins and pumping stations), and*
- (b) *stormwater quality control systems (such as waste entrapment facilities, artificial wetlands, sediment ponds and riparian management), and*
- (c) *stormwater reuse schemes.*

The pathway and seating area works are ancillary to the stormwater management system works, but are also defined as *recreation area*, which means:

a place used for outdoor recreation that is normally open to the public, and includes—

- (a) *a children’s playground, or*
- (b) *an area used for community sporting activities, or*
- (c) *a public park, reserve or garden or the like,*

4.2.2 Permissibility

Clause 2.137(1) of T&I SEPP provides that development for the purpose of stormwater management systems may be carried out by or on behalf of a public authority without consent on any land. Part 2 of the clause specifies that this includes construction works.

Clause 2.73(3) of the SEPP provides that development for the purposes of pedestrian pathway and recreation areas can be undertaken by a public authority within parks and reserves.

The works will be carried out on behalf of Byron Shire Council and therefore can be carried out without development consent.

As such, the project becomes an 'Activity' for the purposes of Part 5 of the *Environmental Planning and Assessment Act 1979*.

4.3 Environmental Planning and Assessment Act 1979

Section 5.1 of the Act defines an 'Activity' as the carrying out of work that does not require development consent under Part 4 of the Act.

As outlined above, the proposed work does not require development consent by virtue of Clauses 2.137 and 2.73 of T&I SEPP.

For the purposes of Section 5.3 of the Act, Byron Shire Council is the proponent of this activity. Council is also the determining authority for the purposes of Section 5.2.

Section 5.5 of the Act specifies the duty of the determining authority to consider environmental impact:

For the purpose of attaining the objects of this Act relating to the protection and enhancement of the environment, a determining authority in its consideration of an activity shall, notwithstanding any other provisions of this Act or the provisions of any other Act or of any instrument made under this or any other Act, examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity

Provisions relating to this duty are outlined in the Regulation to the Act.

Section 5.7 of the Act specifies that a determining authority cannot carry out an activity that is likely to significantly affect the environment unless it has considered an environmental impact statement in respect of that activity.

Given the location and extent of works proposed, and the vegetation removal required, it is considered that the works have the potential to significantly affect the environment. This EIS has therefore been prepared to assist Council in assessing potential impacts, in accordance with the requirements of the Act.

4.4 Environmental Planning and Assessment Regulation 2021

Provisions relating to infrastructure and environmental impact assessment are contained in Part 8 of the Regulation.

Clause 173 of the Regulation requires that, before preparing an EIS, the person responsible must apply to the Planning Secretary for the environmental assessment requirements for that activity. Clause 191 requires that the EIS must comply with the Secretary's environmental assessment requirements (SEARs)

A list of the SEARs and where they have been addressed in this EIS is provided in the table contained in **Appendix A**.

Clause 171 of the Regulation sets out the environmental factors that need to be considered when assessing environmental impact under Part 5 of the EP&A Act. These factors are addressed in this report and are listed below.

Table 4-1 | Review of Clause 171 Factors

Clause 171 Factors	Adverse Impact			
Any environmental impact on a community?	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
The proposal may have minor short term negative impacts associated with construction (noise, convenience of access). However, the activity will ultimately have a positive impact by improving				

Clause 171 Factors	Adverse Impact
stormwater quality at Clarkes Beach, mitigating local flooding, improving site amenity and access across the site and delivering positive cultural and social outcomes.	
Any transformation of a locality?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Transformation of part of the subject site will occur as a result of the project, replacing the current degraded drains and terrestrial vegetation within the project footprint with a managed wetland system and ancillary recreation areas (pathways and seating). On completion of construction and planting, the area will retain a natural setting that is complementary to the locality.	
Any environmental impact on the ecosystems of the locality?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The Biodiversity Development Assessment Report (BDAR) submitted in support of the proposal contains an assessment of ecosystem impacts, demonstrating actions undertaken to avoid and minimise ecological impacts. The project will restore degraded terrestrial vegetation and biodiversity offsets are required for the residual unmitigated impacts.	
Any impact on the aesthetic, recreational, scientific or other environmental quality or value of a locality?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The activity will improve the site for recreation purposes, whilst no substantial change of note is anticipated regarding scientific or environmental values. The project will have a positive impact on the aesthetic values of the site, providing a natural setting of a wetland ecosystem.	
Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<p>The design of the project was undertaken in consultation with Bundjalung of Byron Bay Aboriginal Corporation (Arakwal) and Tweed Byron Local Aboriginal Lands Council using Connecting with Country principles. In consultation with local Aboriginal representative, areas and vegetation of high cultural value were avoided by minimizing the disturbance footprint.</p> <p>The activity is not likely to have an adverse impact on the locality. The Aboriginal Cultural Heritage and Historical Heritage Assessment reports submitted in support of the EIS (Niche, 2023) provide an assessment of the potential effects on Aboriginal cultural and historical values of the locality.</p>	
Any impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The proposed activity will not have any adverse impacts on the habitat of protected animals. See BDAR report submitted in support of this EIS.	
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The proposed activity will not cause the endangering of any species of animal, plant or other form of life. See BDAR report submitted in support of this EIS.	
Any long-term effects on the environment?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<p>The proposal is not considered to have any long-term effects on the environment. A number of the supporting studies have addressed the potential long-term impacts, including:</p> <ul style="list-style-type: none"> Construction Water Management Plan (ENV, 2023) Acid Sulfate Soils Management Plan (ENV, 2023) Coastal Impact Assessment (BMT, 2022) Flood Impact Assessment (BMT, 2023) <p>The assessments documented in these studies demonstrate that the construction and ongoing operation of the wetland system will not result in any detrimental long-term environmental impacts.</p>	

Clause 171 Factors	Adverse Impact
Any degradation of the quality of the environment?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The proposed activity will not cause any degradation of the environment as it is located on disturbed and modified land. As above, detailed environmental studies have been undertaken to confirm that the construction and ongoing operation of the wetland system will not result in any detrimental long-term environmental impacts.	
Any risk to the safety of the environment?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Construction of the proposed activity will not result in a risk to the safety of the environment. All proposed works are temporary and contained on highly disturbed and modified land. The following studies confirm that construction activities can be managed in way that protects the environment:	
<ul style="list-style-type: none"> • Construction Water Management Plan (ENV, 2023) • Construction Air Quality Impact Assessment (EMM, 2023) • Construction Noise and Vibration Management Plan (Acousticworks, 2023) • Construction Traffic Management Plan (Planit, 2023) • Waste Management Plan ENV, 2023) 	
Post construction, the works will reduce risk to the safety of the environment by improving the quality of stormwater being discharged into the marine environment.	
Any reduction in the range of beneficial uses of the environment?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The proposed activity introduces a range of beneficial uses of the environment through improvements in stormwater quality and additional flood storage.	
Any pollution of the environment?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Construction methods will ensure there is no pollution of the environment and all waste will be disposed of correctly.	
Post construction, the works will reduce pollution of the environment by improving the quality of stormwater being discharged into the marine environment.	
Any environmental problems associated with the disposal of waste?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Waste from construction of the project will primarily consist of cleared vegetation, which, except for exotic weeds, will be mulched and reused on site, and excavated soil, which will be tested and treated in accordance with the Acid Sulfate Soils Management Plan (ENV, Oct, 2023). Disposal of any of this material will be undertaken in accordance with relevant standards and legislative requirements to ensure that no environmental impacts result.	
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The proposal will not increase demands on resources that are, or are likely to become, in short supply.	
Any cumulative environmental effect with other existing or likely future activities?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The proposal is unlikely to cause any cumulative environmental impacts given the proposed works are on highly disturbed and modified land.	
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
The proposal will not impact on coastal processes or coastal hazards. See Coastal Impact Assessment submitted in support of this EIS (BMT, 2022).	

4.5 Environmental Planning Instruments

4.5.1 State Environmental Planning Policies

A summary of relevant SEPPs that are applicable to this project is outlined below in Table 4-1.

Table 4-2 | Relevant SEPPs

SEPP	Comment
SEPP (Biodiversity and Conservation) 2021	<p><u>Chapter 4 Koala habitat protection 2021</u></p> <p>The chapter contains provisions relating to development assessment in relation to land to which an approved koala plan of management applies. The provisions, however, relate to the assessment and determination of development applications.</p> <p>As outlined above, a development application is not required for the proposed works.</p> <p>Council has adopted the Byron Coast Comprehensive Koala Plan of Management. The site is located within the South Byron Coast Koala Management Area outlined in that Plan, but it is not within a Koala Management Precinct.</p> <p>Notwithstanding, Council's online mapping shows the presence of potential koala habitat within the proposed work area.</p> <p>This has been examined in the BDAR report (Planit, 2023), which notes:</p> <p>Preferred habitat (i.e. eucalypt forests) for the koala is absent from the site. Preferred koala food trees within the site were limited to an individual Forest Red Gum (<i>Eucalyptus tereticornis</i>), which will not be impacted.</p>
SEPP (Resilience and Hazards) 2021	<p><u>Chapter 2 Coastal Management</u></p> <p>For the purposes of this Chapter:</p> <ul style="list-style-type: none"> a small strip of the northern part of the land is mapped within the Coastal Environment Area; the majority of the site is mapped within the Coastal Use Area; none of the site is mapped as containing Coastal Wetlands or land in proximity to Coastal Wetlands; and a part of the eastern side of the site is mapped as land in proximity to Littoral Rainforest, with the mapped Littoral Rainforest located within the Massinger Street road verge (see Figure 4-1). <p>The proposed activity will not negatively impact visual amenity, overshadowing, access or amenity conditions, nor is any increase to the risk of coastal hazards anticipated. On the contrary, the proposed activity would result in improved amenity conditions and prevent soil degradation, erosion and sedimentation of receiving waters.</p> <p><u>Chapter 4 Remediation of Land</u></p> <p>A detailed site contamination investigation was carried out on the site in 2021 (ENV, 2023).</p> <p>The investigation noted that sand mining occurred in the area in the 1950s and 1960s, raising the potential for the presence of radioactive mineral sand processing tailings. All radiation readings taken across the site were less than the relevant assessment criteria.</p> <p>Overall, the investigation and sampling undertaken demonstrated that the site is suitable for the intended purpose.</p>

SEPP	Comment
SEPP (Transport & Infrastructure) 2021	<p>As outlined in Section 4.2.1 (above), the proposed works are defined as <i>stormwater management system</i> in accordance with clause 2.136 of this SEPP.</p> <p>Clause 2.137(1) provides that stormwater management systems can be carried out on any land by a public authority without development consent.</p> <p>The pathway and seating areas works are ancillary to cl2.137(1) works and can also be carried out without consent pursuant to clause 2.73 of the SEPP.</p>



Figure 4-1 | SEPP (Resilience & Hazards) 2021 Mapping

4.5.2 Local Environmental Plans

The land subject to the proposed Activity is 'deferred matter' under *Byron Local Environmental Plan 2014* (LEP 2014). It therefore retains the zoning applicable under *Byron Local Environmental Plan 1988* (LEP 1988) and is subject to the provisions of that Plan.

As shown in **Figure 4-2**, that zoning is part 1(d) Investigation Zone and part 7(b) Coastal Habitat Zone.

For the purpose of LEP 1988, the proposed works are defined as a **public utility undertaking**, which means:

any of the following undertakings carried on or permitted or suffered to be carried on by or by authority of any Government department or under the authority of or in pursuance of any Commonwealth or State Act—

(a) railway, road transport, water transport, air transport, wharf or river undertakings,

(b) undertakings for the supply of water, hydraulic power, electricity or gas or the provision of sewerage or drainage services,

and a reference to a person carrying on a public utility undertaking shall be construed as including a reference to a council, county council, Government department, corporation, firm or authority carrying on the undertaking

The project also includes ancillary environmental facilities and clearing of land, as defined in LEP 1988.

Public utility undertakings are not listed as permissible in either the 1(d) or 7(a) zones.

Clause 62, however, provides a 'saving', whereby public utility undertakings relating to drainage are not prohibited and do not require consent. In any event, the proposed works are permissible without consent under the SEPP Transport and Infrastructure.



Figure 4-2 | Zoning

4.6 NSW Legislation

4.6.1 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016*, together with the *Biodiversity Conservation Regulation 2017*, outlines the framework for addressing impacts on biodiversity from development and clearing. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme (BOS).

The BOS creates a transparent, consistent and scientifically based approach to biodiversity assessment and offsetting for all types of development that are likely to have a significant impact on biodiversity. It also establishes biodiversity stewardship agreements, which are voluntary in-perpetuity agreements entered into by landholders, to secure offset sites.

The Scheme applies to:

- Local development (assessed under Part 4 of the Environmental Planning and Assessment Act 1979) that is likely to significantly affect threatened species or triggers the Biodiversity Offsets Scheme threshold;
- State significant development and state significant infrastructure projects, unless the Secretary of the Department of Planning and Environment and the Chief Executive of OEH determine that the project is not likely to have a significant impact;
- Biodiversity certification proposals;
- Clearing of native vegetation in urban areas and areas zoned for environmental conservation that exceeds the Biodiversity Offsets Scheme threshold and does not require development consent;
- Clearing of native vegetation that requires approval by the Native Vegetation Panel under the *Local Land Services Act 2016*; and
- Activities assessed and determined under Part 5 of the Environmental Planning and Assessment Act 1979 (generally, proposals by government entities), if proponents choose to 'opt in' to the Scheme.

The BOS Threshold is a test used to determine when is necessary to engage an accredited assessor to apply the Biodiversity Assessment Method (the BAM) to assess the impacts of a proposal.

It is used for local developments (development applications submitted to councils) and clearing that does not require development consent in urban areas and areas zoned for environmental conservation.

The *Biodiversity Conservation Regulation 2017* sets out threshold levels for when the BOS will be triggered. The threshold has two elements:

- whether the amount of native vegetation being cleared exceeds a threshold area set out in the legislation; and
- whether the impacts occur on an area mapped on the Biodiversity Values map published by the Minister for the Environment.

If clearing and other impacts exceeds either trigger, the BOS applies to the proposed development, including biodiversity impacts prescribed by clause 6.1 of the *Biodiversity Regulation 2017*.

This project will be assessed and determined under Part 5 of the *Environmental Planning and Assessment Act 1979*. The proponent has chosen to 'opt in' to the Biodiversity Offset Scheme to offset unavoidable impacts as a result of the project.

A Biodiversity Development Assessment Report (BDAR) has therefore been prepared to accompany the proposed activity.

The findings of the BDAR are summarised in section 6.3 of this EIS.

4.6.2 Coastal Management Act 2016

The CM Act 2016 aims to manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State.

The Act defines the coastal zone and management objectives for coastal management areas and provides for local Councils to prepare Coastal Management Programs.

Further provisions relevant to the coastal management areas is outlined in Chapter 2 of *State Environmental Planning Policy (Resilience and Hazards) 2021*, discussed in Section 4.5.1 of this report.

4.6.3 Crown Land Management Act 2016

The CLM Act 2016 regulates the ownership, use and management of the Crown land of New South Wales and requires environmental, social, cultural heritage and economic considerations to be taken into account in decision-making about Crown land.

Lot 383 is Crown Land. A search of public records did not identify an adopted or draft Plan of Management applicable to the subject site.

As per Division 2.5 of the CLM Act 2016, the Minister may issue a licence, or the like, over Crown land. A licence is required for the proposal as the extent of works include activities on Crown land. Obtaining this licence from Department of Planning and Environment Crown Lands is required prior to the commencement of works.

4.6.4 Aboriginal Land Rights Act 1983

The Aboriginal Land Rights Act provides land rights for Aboriginal people in NSW. It creates a system of land rights to compensate Aboriginal communities for the loss of their land by allowing for the return of eligible Crown Land to Aboriginal ownership. The NSW and local Aboriginal Land Councils can lodge Aboriginal Land Claims (ALCs) for ownership of some Crown Land and Crown Lands facilities the return of eligible land to Aboriginal Land Councils. The principle of self-determination underpins the Aboriginal Land Rights Act, and land is vested in representative Land Councils that work to deliver economic, social and cultural benefits to Aboriginal communities in NSW.

Lot 383 DP 728202 is the subject of an Aboriginal Land Claim under the Aboriginal Land Rights Act. The construction licence to be issued by Department of Planning and Environment Crown Lands to Council will need to comply with the requirements of the Aboriginal Land Rights Act.

4.6.5 Fisheries Management Act 1994

The FM Act 1994 provides for the protection, conservation, and recovery of threatened species, populations and ecological communities of fish and marine vegetation and fish habitats, as well as promoting the development and sharing of fishery resources in NSW.

The proposed works do not involve harm to mangroves or other protected marine vegetation, dredging or reclamation, blocking of fish passage and does not involve impact to any Key Fish Habitat waterway.

The works will therefore not require a Part 7 Fisheries Permit under the FM Act.

4.6.6 Heritage Act 1997

The *Heritage Act 1997* aims to conserve environmental heritage in NSW. It is used to regulate development impacts on the State's historical heritage assets.

Searches on the State Heritage Inventory database and Schedule 5 of the Byron Local Environmental Plan 2014 were undertaken for the proposed works area.

The works area does not comprise any State Heritage Register or local listed items.

The proposed activity will therefore not have an impact on any heritage items or places. Approval of works on the site is therefore not required under Part 4 of the Heritage Act 1977.

4.6.7 National Parks and Wildlife Act 1974

The NP&W Act 1974 regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas (among others). The subject site is not on land identified as National Park or Nature Reserve, but is located 'downstream' of the Cape Byron State Conservation Area and the Arakwal National Park. The proposed activity is therefore not likely to impact any conservation areas.

The Act also aims to conserve the Aboriginal cultural heritage of NSW and, where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required. An AHIP will need to be issued for this project, and Cultural heritage issues are addressed in Section 6.1 of this EIS and in the Aboriginal Cultural Heritage and Historical Heritage Assessment reports submitted in support of the EIS (Niche, 2023).

4.6.8 Water Management Act 2000

A primary objective of the WM Act 2000 is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs.

Section 91E of the Act establishes an approval regime for controlled activities within waterfront land. The subject site is not located within waterfront land as defined under the WM Act.

Notwithstanding, clause 41 of the *Water Management (General) Regulation 2018* provides an exemption for public authorities in relation to all controlled activities on waterfront land. Accordingly, approval under the WM Act 2000 is not required.

4.6.9 Marine Estate Management Act 2014

The Cape Byron Marine Park has been established under this Act and includes the area directly north of the site, from the mean high water mark to three nautical miles offshore.

The outflow from the Clarkes Beach stormwater outlet flows into the Marine Park.

The improvement in stormwater quality provided by the proposed wetland system will therefore directly benefit the Marine Park.

4.7 Commonwealth Legislation

4.7.1 Native Title Act 1993

Native Title is the recognition in Australian law that Indigenous people continue to hold rights to their land and waters, which come from their traditional laws and customs. Native title can be extinguished (refused recognition) because of actions the government has done, or allowed others to do, over a particular area that are inconsistent with Native Title.

Native Title exists alongside and subject to the rights of other people in the same area and can only be claimed on certain areas of land or water, such as vacant or unallocated Crown Land and not on residential freehold land or public operational land like roads, schools or hospitals.

A search of the National Native Title Tribunal Register and Register of Indigenous Land Use Agreements identified, relevant to Lot 383 in DP 728202:

- Indigenous Land Use Agreement NI2006/004 - Bundjalung People of Byron Bay (ILUA 2) registered on 22 April 2008. Under this ILUA, Native Title rights and interests in Lot 383 DP728202 were surrendered.

4.7.2 Environmental Protection and Biodiversity Conservation Act 1999

The EPBC Act 1999 protects matters of National Environmental Significance (NES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places (among others). Any actions that will, or are likely to, have a significant impact on the matters of NES require referral and approval from the Australian Government Environment Minister. Significant impacts are defined by the Commonwealth for matters of NES.

A preliminary search of records held by the Australian Department of Environment and Energy's Protected Matters Search Tool found that 1 threatened ecological community, 74 threatened species and 55 migratory species of national significance were recorded within the vicinity of the subject site.

The Significant Impact Criteria, published by the Commonwealth Department of the Environment (2013), was applied to:

- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland [Endangered];
- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia [Critically Endangered];
- Stinking Cryptocarya (*Cryptocarya foetida*) [Vulnerable]; and

- Grey-headed Flying-fox (*Pteropus poliocephalus*) [Vulnerable].

Relevant significant impact assessments for the threatened entities listed above are provided in the BDAR submitted in support of this project.

The following matters are required to be considered under the EPBC Act when determining if the proposal should be referred to the Commonwealth Department of Environment and Energy for assessment.

Table 4-3 | Review of Matters of NES

Matters of NES	Significant Impact
Any impact on a World Heritage Property?	No
The activity is not located on or within proximity to a World Heritage property.	
Any impact on a National Heritage place?	No
The activity is not located on or within proximity to a National Heritage Place.	
Any impact on a wetland of international importance?	No
The activity is not located on or within proximity to a wetland of international importance.	
Any impact on a listed threatened species or communities?	Yes
The activity will impact listed threatened species or communities as described above. The impacts are assessed in detail in the BDAR report. The project will be referred under the EPBC Act for a decision whether the proposed activity requires assessment and approval under the EPBC Act.	
Any impacts on listed migratory species?	No
The activity will not have any impacts on listed migratory species.	
Does the proposal involve a nuclear action (including uranium mining)?	No
No nuclear action proposed.	
Any impact on a Commonwealth marine area?	No
The activity is not located on or within proximity to a Commonwealth marine area.	
Any impact on the Great Barrier Reef Marine Park?	No
The activity is not located on or within proximity to the Great Barrier Reef Marine Park.	
Any impact on water resources from coal seam gas development and large coal mining development?	No
No coal seam gas or coal mine development is proposed.	
Additionally, any significant impact (direct or indirect) on Commonwealth land?	No
There is no impact on Commonwealth land.	
Additionally, any significant impact (direct or indirect) on the environment generally as a result of a Commonwealth action?	No
No significant impact on the environment as a result of a Commonwealth action is proposed or likely.	

4.8 NPWS Estate

Figure 4-3 (below) shows the location of nearby NPWS Estate, being the Cape Byron State Conservation Area, located to the north-east of the study area, and the Arakwal National Park, located to the east.

Both these areas are situated 'upstream' of the subject site, with stormwater from small parts of those areas travelling to the site through existing road drainage.

The works will have no direct impact on these areas of NPWS Estate. All stormwater flows away from these national park areas, and thus the works will also not result in any indirect impacts.

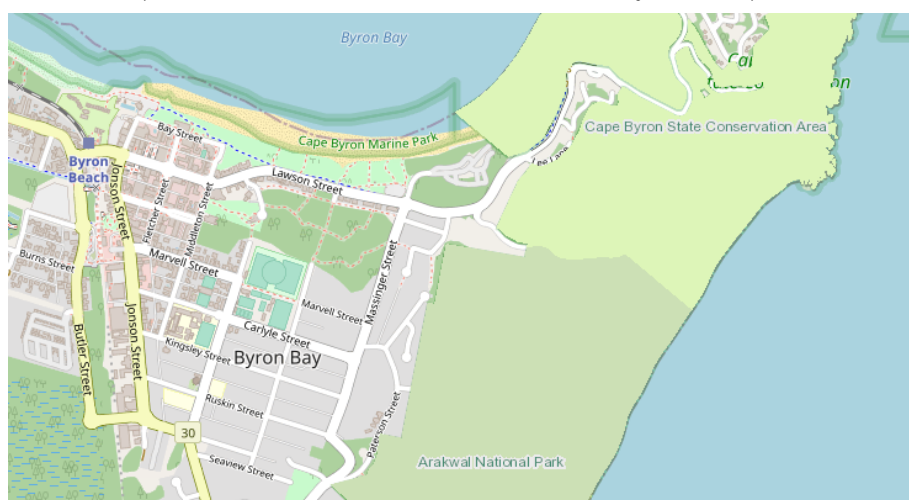


Figure 4-3 | Nearby NPWS Estate

4.9 Additional Processes Required

The works will require the following additional processes prior to the commencement of works:

- Department of Planning and Environment Crown Lands licence to Byron Shire Council issued in accordance with *Crown Land Management Act 2016*;
- Referral under Part 9 of the (Commonwealth) *Environmental Protection and Biodiversity Conservation Act 1999* for a decision whether the activities require assessment and approval under that Act.
- Aboriginal Heritage Impact Permit (AHIP) under Part 6 of the *National Parks and Wildlife Act 1974*, for harm to Aboriginal objects.

5 Consultation and Identification of Issues

5.1 Community Consultation

The following engagement activities have been undertaken in the local area:

- Website – Byron Shire Council established the page “Restoring the Sandhills Wetlands in Byron Bay” as a dedicated space to provide ongoing information about the project <https://www.byron.nsw.gov.au/Council/Council-projects/Ongoing-projects/Restoring-the-Sandhills-Wetlands-in-Byron-Bay> ;
- Neighbouring residents letter box drop – a letter was distributed to adjoining homes advising of the project and inviting feedback into the preparation of the EIS; and
- Engagement with representatives from Bundjalung of Byron Bay Aboriginal Corporation, Arakwal and Tweed Byron Local Aboriginal Land Council on the design of the works using Connecting with Country principles and for the Aboriginal Cultural Heritage Assessment and Aboriginal Heritage Impact Permit processes.

5.2 State Agencies Consultation

As required by the SEARs, consultation with State Agencies was undertaken in May 2023 to assist the preparation of this EIS. Table 5-1 summarises the consultation and the responses received.

Together with the SEARs, the agency responses have assisted in the identification of key issues addressed in this EIS and supporting studies.

Table 5-1 | State Agency Consultation

Agency	Response	Comments
NSW Health	Notes the development site forms part of areas used for intensive sand mining operations that occurred between the 1930's and 1960's. Historically, development sites within areas mined for sand in the Byron Bay area have been required to consider and assess radiological impacts associated with historical rutile mining and processing operations. The NCPHU requests the proposed contaminated land assessment consider and assess, where relevant, any impact associated with radiological residues that could be present as result of sand mining at the site to ensure no unacceptable human health impacts occur through the construction and ongoing use stages for the development.	Issues are addressed in the detailed site investigation report undertaken by ENV Solutions. See Section 6.2.2 of this EIS.
Crown Lands	Lot 383 DP 728202 is Crown Land. The land will need to be acquired under the Land Acquisition (Just Terms Compensation Act 1991) Prior to acquisition, a licence will be required to use the site. The land is subject to an undetermined Aboriginal Land Claim. Consultation with the NSW Aboriginal Land Council would be required.	Council has confirmed: <ul style="list-style-type: none">the project has been planned and designed in close consultation with Department of Planning and Environment - Crown Lands and NSW Aboriginal Land Council.Department of Planning and Environment - Crown Lands have confirmed they are able to, and have NSW Aboriginal Land Council agreement to, issue a construction licence to Council, subject to them first reviewing the final EIS.
Dept Planning and Environment (Northern Region)	Note that the SEARs are comprehensive and Northern Region does not have anything further to add	No further action required. See Appendix A for summary of response to SEARs.
DPE – Environment Group	Recommend consultation with “Bundjalung of Byron Bay Aboriginal Corporation”.	Council has confirmed that the project has been designed in close consultation with the Bundjalung of Byron Bay Aboriginal Corporation (Arakwal) and Tweed Byron Local Aboriginal Land Council, and the design has been informed Connecting with Country principles.

Agency	Response	Comments
		See also Aboriginal Cultural Heritage Assessment prepared by Niche Environment and Heritage, and summary in Section 6.1 of this EIS.
	EIS should address impacts on mapped Coastal Wetlands and Littoral Rainforests.	As noted in Section 4.5 of this report, there are no mapped coastal wetlands in proximity to the works site. There is a small area of Littoral Rainforest mapped within the Massinger Street Road reserve. The works will not directly impact that mapped area. As the mapped area is "upstream" of the works site, the stormwater drainage works will not result in any indirect impacts on this area.
	BDAR is required to consider strategies and actions to avoid and minimise impacts on threatened species and communities and assess unavoidable impacts on those species and communities.	See BDAR and summary in Section 6.3 of this EIS.
	The EIS should consider coastal processes and hazards.	See Coastal Assessment prepared by BMT and summarised in Section 6.5 of this EIS.
DPI Cape Byron Marine Park	Support the intent of the project to improve stormwater quality at the Clarkes Beach outlet. Potential impacts to the Marine Park should be considered.	The results of modelling of resulting stormwater quality is presented in Table 3-1, demonstrating that the project will result in significant improvement in the quality of stormwater leaving the system. This will have a direct beneficial impact for the Marine Park.
Environment Protection Authority	No response	
Heritage NSW	No response	
Local Land Services	No response	
National Parks and Wildlife Service	No response	
Regional Growth and Development Corporation	Advised that Corporation has no role in the Byron Local Government Area	

Agency	Response	Comments
Regional NSW Group	No response	
Rural Fire Service	Note that the site is mapped as bush fire prone land. RFS has no objection to the proposal, noting that the project will not directly increase the bush fire risk to adjoining properties.	On the basis of this advice, a detailed bush fire assessment has not been undertaken.
DPI Agriculture	The proposed Sandhills Wetland Project is not located on or adjacent to any significant agricultural resources and is not expected to adversely impact agricultural production in the wider area, NSW DPI Agriculture has no comments or additional requirements for the EIS for this project	No action or reports required.
SafeWork NSW	No response	
DPE Environment Group	No response	
DPE Water	Advise that they will undertake an assessment of groundwater impacts at the EIS stage.	See Section 6.2 of this EIS.

6 Environmental Assessment

6.1 Cultural Heritage

A detailed *Aboriginal Cultural Heritage Assessment* and associated *Archaeological Report* and *Archaeological Test Excavation* report have been undertaken by Niche Environment and Heritage, and form part of the information package for this EIS.

The assessment included background archaeological and historical investigation, ongoing consultation with the Registered Aboriginal Parties (RAPs) and an archaeological survey that included representatives from Tweed Byron Local Aboriginal Land Council (TBLALC), and Bundjalung of Byron Bay Aboriginal Corporation – Arakwal.

6.1.1 Aboriginal Heritage Information Management Systems (AHIMS)

The initial search of the AHIMS database identified that no previously recorded Aboriginal cultural heritage sites are located within the site.

Four previously recorded AHIMS sites are located between 240 to 1080 metres from the site and include midden deposits and/or isolated shell.

Table 6-1 | Previously Recorded AHIMS Sites

AHIMS ID	Site Type	Approx Distance from Site (m)
04-4-0043	Midden	1,080
04-5-0358	Midden	240
04-5-0459	Midden	330
04-5-0199	Midden and Aboriginal Resource and Gathering	460

6.1.2 Predictive Modelling

Based on the background research and existing data for the local area and region, Niche developed a predictive model for the site to determine its archaeological potential (*Archaeological Test Excavation*, Niche, 2023).

The following criteria were used for this modelling:

- Patterns of Aboriginal land use and occupation of the region, to identify those landscape areas where material was likely to have been deposited.
- Distribution of known sites within the region, to identify the landforms known to contain archaeological materials (and patterning of those materials).
- Geomorphic evolution, including soil characteristics, of the Subject Area, to identify those natural processes that may have affected the archaeological resource.
- Likely detection of archaeological materials within the Subject Area, considering the nature of the resource (surface/ sub-surface materials) and ground surface visibility constraints.
- The nature of past land use within the Subject Area to consider the likely level of integrity of any potential Aboriginal objects found.

Based on these criteria, the predictive model developed by Niche is outline in Table 6-2.

Table 6-2 | Predictive Model of Cultural Heritage for the Site (Niche, 2023)

Site Type	Description and Predictions
Shell middens	<ul style="list-style-type: none"> This site type represents the most common Aboriginal cultural heritage site type in the area and the most likely to be identified within the Subject Area. Shell middens are open campsites dominated by shellfish remains which vary in size. Middens may contain stone artefacts, charcoal from cooking fires, ochre nodules, and animal bone. Human burials have also been recorded within midden deposits, including middens along the foredunes north of Byron Bay.
Isolated stone artifacts	<ul style="list-style-type: none"> These can be located anywhere in the landscape and represent either the remnant of a dispersed artefact scatter (open campsite), or the simple loss or random discard of artefacts.
Potential archaeological deposits (PADs)	<ul style="list-style-type: none"> Potential Archaeological Deposits (PADs) are likely to occur where intact soil profiles are present in association with well drained flats. The occurrence of sub-surface material is not predicated on finding Aboriginal objects upon the surface.
Burials	<ul style="list-style-type: none"> Most Aboriginal burials recorded on the NSW north coast seem to have been primary interments in soft sediments (deep, soft sandy sediments, such as Aeolian or alluvial deposits) above the floodwaters such as source-bearing sand-dunes, sand ridges, lunettes, and levees adjacent to waterways. Burial sites may occur in association with the sandy dune contexts that are found on the margins of dunes and creek banks, or have been unearthed during development activities. Burials have been reported within foredune middens north of Cape Byron (AHIMS ID#4-5-037), and in association with pipi shell on the crest of an elevated subcoastal sand knoll on the western edge of Belongil-Cumbebin Swamp (AHIMS ID#4-5-142).
Open camp sites	<ul style="list-style-type: none"> Open Camp Sites containing surface stone artefacts (including artefact scatters or few stone artefacts). This site type may be associated with additional archaeological features such as hearths/ovens, middens, burials and/or Potential archaeological deposits (PADs). Raw material for stone artefacts will most likely be sourced from outside the Subject Area from known and/or unknown sources. The assemblage will likely have resulted from activities such as artefact processing, use and/or maintenance that may have been undertaken while occupying the area. This site type will almost always be located near permanent or semi-permanent sources of water. This site type is expected to occur on level well-drained ground with an elevated portion over a water source.
Scarred trees (carved or scarred)	<ul style="list-style-type: none"> Scarred trees are trees that have been scarred through the deliberate removal of bark or wood for making material items; such as shelters, canoes, shields, boomerangs, containers, and rope/twine, or which have been marked for other reasons. It is anticipated that that survival of scarred trees is dependent on the extent of previous disturbances within the Subject Area.

6.1.3 Test Excavations

The proposed works within the site will require ground disturbance in an already moderately disturbed context. During initial site survey, archaeological visibility was low to nil across the majority of the site, but an area of potential archaeological deposit (PAD) was identified in the northern portion, where the density of the vegetation lessened and there were a couple of minor areas of sheet wash erosion.

To allow for a more robust assessment of archaeological potential, a second site survey was undertaken in conjunction with minor, non-ground disturbance, vegetation clearance. An isolated find, a quartz flake, was identified in the PAD area. The PAD with artefact was registered on the Aboriginal Heritage Management Information Systems (AHIMS), on 28 November 2022, and was given the AHIMS ID #04-5-0379 Cowper Street Byron PAD with Artefact.

Under the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and the Principles of Ecologically Sustainable Development, consideration has been given to whether there is sufficient scientific knowledge to evaluate the proposed impacts.

A further program of archaeological test excavation was undertaken between the 8 and 11 August 2023, involving test units were completed over two areas. Fourteen Aboriginal artefacts were retrieved during the program and are detailed in the *Archaeological Test Excavation* report prepared by Niche (Oct, 2023), which is Appendix E to the *Aboriginal Cultural Heritage Assessment* (Niche, Dec 2023).

The majority of the materials was a weathered, fine-grained siltstone, with one artefact of greywacke material, a fine-grained, hard sandstone. There are no sources of these materials within the site and no known sources of the materials in the immediate region.

6.1.4 Assessment of archaeological potential

An area of moderate to high archaeological potential has been identified in the north-eastern portion of the site.

The site is situated on Quaternary estuarine alluvium overlain by and/or mixed with Quaternary Pleistocene sands, originating from the adjacent beach ridge sand foredunes. Regular inundation and flooding events occur across the central and south-eastern portions of the site. It does not contain any prominent elevated landforms or features that would have been focal points within the broader landscape that would have provided for intensive occupation. The identified archaeological potential area is indirectly associated with a surface artefact, located outside of the proposed impact area.

Further investigation will provide information on whether the site may contain significant features relating to tangible Aboriginal cultural heritage or identifiable values that would represent any significant aesthetic values.

The site is within the culturally significant broader area of the northern rivers and coastal areas. Information related to the cultural importance of the site to local Aboriginal communities was noted during the site survey. The archaeological investigations within the site have resulted in the identification of Aboriginal archaeological material within the proposed impact area. The cultural objects could be indicative of short-term occupation and transient movement through the landscape during the mid-to-late Holocene.

Due to the presence of a reasonably permanent, unnamed drainage line in the Subject Area, which makes it prone to regularly flooding, it is highly unlikely the site would have been used as a permanent or even temporary camp area. It is possible it would have been used as a base for the collection and use of seasonal resources which are associated with coastal landscapes and would have been well-known and well utilised by Aboriginal people. The small-size assemblage retrieved during the testing program also suggests this (Niche, Oct 2023)

6.1.5 Conclusion

In terms of rarity, the overall site is of low archaeological and scientific significance, with one portion of the site assessed as having a slightly higher significance based on the identified cultural object.

The representativeness of the site is bound with it being a physical example of traditional beach gathering of food resources that continues to the present day. Early European observers emphasise the important role of fish and shellfish in the Aboriginal diet between the Richmond, Brunswick, and Tweed Rivers. No doubt the site was associated with the seasonal movements of fish along north coast beaches.

A number of artefacts were uncovered in the site surveys undertaken for this project. The association of this material alongside intact soils, landform, albeit of identified moderate disturbance, and background for the area indicated the potential for subsurface archaeological deposits to occur.

A range of activities may be reflected, primarily around marine resources exploitation (Niche, Dec 2023).

An operational Aboriginal Heritage Impact Permit (AHIP) will be required prior to the commencement of works. The AHIP, issued under Part 6 of the *National Parks and Wildlife Act 1974*, provides consent to harm Aboriginal objects.

The following recommendations were made by Niche (Dec 2023) on completion of their *Aboriginal Cultural Heritage Assessment*.

Recommendation 1: Aboriginal community consultation

Byron Shire Council should continue to consult with the Aboriginal community in regard to the Project in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010b) and any conditions of the operation AHIP. Consultation may include, but is not limited to:

- Review of the ACHAR with AR.
- Review of the AHIP testing methodology within the AR.
- Participation in excavation program.
- Finalisation of ACHAR and AR.
- Long-term storage/reburial of any material recovered during excavations.
- Potential operational AHIP application/s.
- Unexpected finds protocols put into place.
- Development of any interpretation material if required.

Recommendation 2: Application for test AHIP

The Proponent applied to Heritage NSW for an AHIP to test under s.90 of the NPW ACT 1974 to allow harm to Aboriginal objects by archaeological testing.

The AHIP to test application included mitigation strategies, as well as a methodology for an archaeological testing program to further investigate the potential for intact Aboriginal objects and human remains in accordance with Requirement 14 of the DECCW (2010a) *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. The test excavation methodology was developed in consultation with the RAPs.

Long-term storage of any artefacts located during the test excavation process would be discussed with all of the RAPs prior to the test excavation being undertaken. The long-term disposition of collected artefacts may include reburial onsite or may be managed under a Care and Control Agreement under s.85A(1)(c) of the National Parks and Wildlife Act 1974. Temporary storage would be in a locked cupboard at the Niche Environment and Heritage Office, Port Macquarie, NSW.

Recommendation 3: Archaeological testing program

An archaeological excavation program was undertaken to provide evidence regarding the extent, nature, and significance of any subsurface archaeological deposits within the Site. See Appendix E of the *Cultural Heritage Assessment Report - Test Excavation Report*.

Recommendation 4: Application for operational AHIP

An application for an operational AHIP will be required for the site. Conditions of this AHIP should include monitoring of the works and community collection by representatives of the RAPs.

A Care and Control Agreement undertaken in collaboration with the RAPs will be required to determine the keeping place of Aboriginal objects collected during the monitoring/cultural collections.

Recommendation 5: Worker inductions

All workers should be inducted into the Subject Area, so they are made aware of their obligations under the NPW Act 1974 and any conditions of any operational AHIP prior, during and, after construction activities.

Recommendation 6: Human remains - Stop work provision

In the event that suspected human remains are encountered during the archaeological test excavation or the proposed works all activity and work in the area that may cause further impact, must cease immediately and the following measures undertaken:

- The location, including a 20m curtilage, should be secured using barrier fencing to avoid further harm.
- The NSW Police must be contacted immediately.
- No further action is to be undertaken until the NSW Police provide written notification to the Proponent.
- If the skeletal remains are identified as Aboriginal, the Proponent must contact the following:
 - The DPIE Enviroline on 131 555.
 - The representatives of the RAPs.
- No works are to continue until Heritage NSW provides written notification to the Proponent.

Recommendation 7: Unexpected finds procedure

The following Unexpected Finds Procedure should be put in place as a minimum response in the unlikely event of the identification of artefacts within the Subject Area:

- Work in the surrounding area is to stop immediately.
- A temporary fence is to be erected around the Aboriginal cultural heritage site, with a buffer distance of at least 5m from the known outer extent of the Aboriginal cultural heritage site.
- An appropriately qualified archaeological consultant is to be engaged in collaboration with a RAP representative to identify the material.
- Should the material be confirmed as an Aboriginal object or archaeological site, facilitate, in co-operation with the local Aboriginal community and the appropriate authorities:
 - The recording and assessment of the finds.
 - Compliance with any legal requirements and Heritage NSW directions.
 - The development and implementation of appropriate management strategies based on an assessment of significance of the finds.
- Recommencement of ground disturbance works may only resume once legal requirements are fulfilled.

6.2 Soil and Water

6.2.1 Hydrology and Water Management

A *Construction Water Management Plan* (Env, 2023) forms part of the information package supporting this EIS.

As described above, the site features a highly modified watercourse and constructed drain that is fed by a piped urban network with outlets onto the site from the north-east, east and south.

This watercourse is classed as a first order stream in accordance with the *Water Management Regulation* (2018). The proposed stormwater management system works include widening and

deepening of the existing channel in order to form the wetland cells and to allow for stormwater flows to spread out through the wetland.

A surface water logger was installed within the existing on-site waterway, and surface water level monitoring undertaken for a one-year period between December 2021 and December 2022.

Large fluctuations in surface water level were observed throughout the monitoring period, correlating with rainfall events and the status of the outlet (blocked or free flowing) onto Clarkes Beach.

High surface water levels were recorded during periods where the outlet was inundated by sand subsequently preventing surface water drainage of the site.

Over the monitoring period surface water levels fluctuated from a minimum of RL 1.99m AHD to a maximum of RL 2.71m AHD, with a mean level of RL 2.04m AHD.

The site and surrounding areas' topography and surface drainage indicate that localised groundwater likely flows to the south-west. Six groundwater bores are listed on WaterNSW database, with a listed purpose of "domestic". It is assumed that water extraction is being used to water gardens.

Large fluctuations in groundwater level were recorded during monitoring of three groundwater monitoring wells, located within the envelope of the proposed wetland cells, between January 2022 and December 2022.

Groundwater levels varied from a minimum of RL 1.07m AHD to a maximum of RL 2.89m AHD. The mean levels across the three monitoring wells were RL 2.29m AHD, RL 2.46m AHD and RL 1.29m AHD.

Baseline groundwater quality is described as slightly acidic to slightly alkaline (pH = 5.11 – 8.40) and high in solids (Total Suspended Solids (TSS) = 191 – 23,280 mg/L). In addition, physiochemical analysis shows the baseline groundwater environment to be freshwater (Electrical Conductivity (EC): 110 - 680 µS/cm).

Guided by sampling recommendations presented in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZEC/ARMCANZ 2000), baseline aluminium (total) concentrations were measured between 70 – 490 µg/L and iron (total) concentrations ranged between 70 – 2440 µg/L.

If disposal of construction water is required, it will be re-used for construction purposes (i.e., dust suppression) and/ or discharged onto land immediately east of the Cowper Street road reserve.

Construction works will be guided by the recommendations in *Construction Water Management Plan* (Env, 2023) to ensure that potential risks to downstream areas, including groundwater dependant ecosystems, are minimised.

6.2.2 Soil Contamination

A detailed site investigation was undertaken in 2021 across the site of the proposed works. The resulting report, *Detailed Site Investigation Sandhills Wetland Project, Cowper Street, Byron Bay NSW* (ENV, 2023) forms part of the information package supporting this EIS.

The objective of the investigation was to assess the potential for contamination at the site as a result of historical or current land uses; and determine if further investigation and/or remediation is required.

The investigation included the following scope of work:

- A desktop review of the site conditions, history and surrounding environment;
- An inspection of the site and adjacent areas of land;
- Identification of past and present potentially contaminating activities and chemicals of potential concern (COPC);
- A preliminary conceptual site model (CSM) based on a desktop study and site inspection;
- Collection of soil samples from surface soils at 38 discrete sampling locations;
- Drilling and/or hand auguring of 12 boreholes to identify if fill materials occur at the site;

- Collection of soil samples from three (3) of these boreholes where possible fill materials were encountered;
- Radiological survey of walking tracks and select wetland cell locations;
- Assessment of the soil analytical results against relevant Tier 1 investigation and screening levels presented in the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999, as amended 2013 (NEPC, 2013); and
- Assessment of the environmental suitability of the site for the proposed land use, from a chemical perspective.

The desktop study identified that the site remains undeveloped with exception of Cowper Street road corridor, featuring an unsealed track through the centre of the site, drainage lines, and several underground services (sewer, stormwater and recycled water main).

Sand extraction activities occurred through the 1950's and early 1960's (discontinued by 1966). The potential exists for uncontrolled fill materials to have been imported to rehabilitate the site, these materials may include radioactive mineral sand processing tailings. Landfilling appears to have occurred along the site perimeter, particularly along Lawson Street and adjoining residential properties, which may have extended into the site area.

Demolition waste identified in the south-eastern portion of the site indicates that illegal dumping has occurred, and the potential exists for further illegal dumping to have occurred.

In summary, considering the current and past land use of the site, possible contamination sources include:

- Importation of uncontrolled fill material to rehabilitate the site and during development of the surrounding areas (extending into the site area);
- Illegal dumping (e.g., demolition waste and contaminated soil); and,
- Radioactive mineral sand processing tailings.

A site and soil investigation and radiological survey were completed in June 2021. The investigations were conducted concurrent with an acid sulfate soil investigation and included a total of 11 investigative boreholes to identify if fill materials exist at the site.

A total of 41 primary soil samples were collected and analysed for the COPC associated with plausible contamination sources. Ten of these samples were additionally scheduled for a broadscale analysis suite to consider the potential for a wide range of contaminants to occur in uncontrolled fill materials and illegally dumped waste.

Anthropogenic refuse was identified to occur in the south-eastern portion of the site. Refuse materials included fibrous cement board which was sampled and analysed for asbestos. No asbestos was detected in the sample.

Reported sample analysis results indicated concentrations of all targeted analytes well below the adopted assessment criteria, with exception of F3 Fraction hydrocarbons supported by sample S-25 (680 mg/kg exceeding the adopted ESL of 300 mg/kg). Additional Total Recoverable Hydrocarbon (TRH) analysis of samples collected from adjacent sample points and the results of a silica gel clean-up analysis indicated that hydrocarbons supported by S-25 were attributable to naturally occurring hydrocarbons, and thus, have not been considered a concern.

Radiological survey results were compared to calculated screening criteria for public and recreational land use. All radiation readings across the site were less than the assessment criteria and were recorded at levels relatively consistent with offsite background levels.

6.2.3 Acid Sulfate Soils

A detailed acid sulfate soils assessment was undertaken in 2021 across the site of the proposed works. The resulting *Acid Sulfate Soil Management Plan* (ENV, 2023) forms part of the information package supporting this EIS.

ENV completed a field program in June 2021, that included six (6) boreholes up to a maximum depth of 5.0m. Samples were collected at 0.5 m intervals in accordance with the ASSMAC Guidelines and scheduled ASS analysis (using the chromium suite).

Laboratory analysis results indicated the presence of Actual Acid Sulfate Soil (AASS) and Potential Acid Sulfate Soil (PASS) material on-site, with the Net Acidity exceeding the adopted action criteria in samples collected from the natural ground surface to a depth of 5.0 mBGL.

Surface soils typically comprised AASS sands with clay and silt inclusions overlaying a PASS clay stratum.

Due to the reported net acidity exceeding the adopted action criteria, an acid sulfate soils management plan (ASSMP) was prepared to mitigate any human-health and environmental impacts from ASS during the proposed redevelopment works.

The assessment undertaken indicated that the material can be managed as four treatment units:

- Unit 1 – Associated with samples BH1_0.65 and BH5_0.0 (noting that this material occurred as a discrete soil stratum). Material at these sample locations comprised silts. The maximum Net Acidity recorded was at BH5_0.0 (344 mol H⁺/t) with an applicable liming rate of 26 kg CaCO₃/t DW. To facilitate practical application and mixing of lime, all soils from the surface to the maximum depth of the silt layer (0.7 mBGL at BH1 and 0.4 mBGL at BH5) shall be treated as Unit 1.
- Unit 2 – Associated with all samples up to a depth of 2.5 mBGL (excluding Unit 1). Soils associated with this management unit primarily comprise sand-clay mixtures overlaying sands. The maximum Net Acidity recorded was at BH5_0.5 (111 mol H⁺/t) with an applicable liming rate of 8 kg CaCO₃/t DW.
- Unit 3 – Associated with all samples from a depth of 2.5 mBGL to 4.0 mBGL, comprising sand material. The maximum Net Acidity recorded was at BH1_3.0 (184 mol H⁺/t) with an applicable liming rate of 14 kg CaCO₃/t DW.
- Unit 4 – Associated with material at a depth of 4.0 mBGL and below comprising clay. The maximum Net Acidity recorded was at BH1_4.5 (724 mol H⁺/t) with an applicable liming rate of 54 kg CaCO₃/t DW.

Mitigation Measures – Soil and Water

- *Site works will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book (4th Edition) on erosion and sediment control and Safe Work Australia 'Excavation Code of Practice (March 2015).*
- *All required erosion and sediment controls would be in place prior to the commencement of work and maintained until all works are completed, in accordance with the NSW Blue Book.*
- *Excavated soils will be managed in accordance with the Acid Sulfate Soils Management Plan (ENV, 2023)*
- *Construction water will be managed in accordance with the recommendations in Construction Water Management Plan (Env Solutions, Sept 2023).*
- *CEMP is to contain suitable unexpected finds protocols and waste handling procedures for managing contaminated soils. This should include, as a minimum:*
 - *Works to proceed with caution and cease immediately if any potential source of contamination are encountered during development, then works should be halted until confirmation of the presence of contamination is undertaken. In instances where contamination is confirmed, remediation in accordance with a Council approved Remediation Action Plan would be required.*
 - *Excess spoil to be disposed offsite from the proposed works will need to be classified pursuant to the EPA Waste Classification Guidelines. Relevant permits may need to be obtained for such waste in accordance with the POEO Act 1997 and the relevant guidelines.*

6.3 Biodiversity

A detailed Biodiversity Development Assessment Report (BDAR) has been prepared in support of the proposed activity.

The BDAR has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued for the proposal on 1 September 2023 by the Planning Secretary of the NSW Department of Planning and Environment (DPE).

It outlines the results of flora and fauna investigations and describes Plant Community Types (PCTs), recorded flora and fauna species, habitat associations and ecological values of the proposed development footprint and surrounding areas.

The development footprint supports three Plant Community Type (PCT):

- PCT 751: Brush Box – Tuckeroo littoral rainforest on coastal headlands of the NSW North Coast Bioregion;
- PCT 1235: Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion; and
- PCT 1064: Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion.

Drainage lines and another largely modified / cleared vegetation communities occur within the project area.

The following PCTs recorded within the development footprint are considered to be reflective of an endangered ecological community listed under the NSW Biodiversity Conservation Act 2016 (BC Act):

- PCT 751 - Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions;
- PCT 1064 – Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions; and
- PCT 1235 – Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregion.

Two patches of PCT 1064 are considered to be reflective of the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1992* (EPBC Act) endangered ecological community known as Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland. Additionally, PCT 751 is considered to be reflective of the critically endangered Littoral Rainforest and Coastal Vine Thickets of Eastern Australia.

Targeted surveys within the development footprint and immediate surrounds were conducted for a number of species between June – July 2021, November 2021 – February 2022, October 2022, April 2023 and August 2023.

Six threatened fauna species listed as vulnerable under the *Biodiversity Conservation Act 2016* were recorded during targeted fauna surveys, being the Sooty Owl (*Tyto tenebricosa*), Wallum Froglet (*Crinia tinnula*), Grey-headed Flying Fox (*Pteropus poliocephalus*), Little Bent-winged Bat (*Miniopterus australis*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*) and Southern Myotis (*Myotis macropus*). The Grey-headed Flying Fox is also listed as vulnerable under the EPBC Act.

Two threatened flora species listed as vulnerable under the *Biodiversity Conservation Act 2016* were recorded during targeted flora surveys. Forty-three (43) Stinking Cryptocarya (*Cryptocarya foetida*) individuals and six (6) Fine-leaved Tuckeroo (*Lepiderema pulchella*) individuals were recorded within the study area. Eleven (11) Stinking Cryptocarya occur within the development footprint and will be required to be removed, while all the recorded Fine-leaved Tuckeroo will be retained.

The BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development footprint during the design, construction and operation of the development.

Avoidance has been maximised through a reduction in design footprint during the concept design process to avoid areas of higher environmental significance. This includes:

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- retaining areas of Wallum Froglet calling activity;
- retaining all recorded individuals of Fine-leaved Tuckeroo (*Lepiderema pulchella*);
- redesigning the proposal to reduce the development footprint where possible;
- reducing the impact footprint towards Littoral Rainforest TEC (PCT 751) and Swamp Sclerophyll Forest TEC (part PCT 1064) through redesign;
- designing the project to ensure there is no significant impacts or changes to the hydrology regimes within retained areas;
- future landscaping incorporating native wetland/swamp sclerophyll species; and
- planting dense areas of Lomandra species along the pond edges to help reduce Cane Toad breeding opportunities.

The resultant area of disturbance (see Design Plans) is considered to be the minimum needed to achieve the desired water quality and flood mitigation outcomes.

The proposal will result in direct impacts on ~2.0777 ha of native vegetation comprising 'PCT 751: Brush Box - Tuckeroo littoral rainforest on coastal headlands of the NSW North Coast Bioregion', 'PCT 1235: Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion' and 'PCT 1064: Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion'.

Approximately 0.5824 ha of 'Highly Disturbed Areas Cleared of Native Vegetation and/or Dominated by Exotic Grasses with Native Flora Scarce' and 0.06689 ha of 'Drainage Channels +/- Areas of Native Vegetation (where not part of a PCT)' will be directly impacted as a result of the proposal.

Fine-leaved Tuckeroo (*Lepiderema pulchella*) is listed as a serious and irreversible impacts (SAIL) entity. The development will retain all individuals of Fine-leaved Tuckeroo, which are well removed from the development footprint, therefore not being impacted upon.

The Little Bent-winged Bat (*Miniopterus australis*) and Large Bent-winged Bat (*Miniopterus orianae oceanensis*) are SAIL entities. No breeding habitat of either of these microbats occur within the site.

No other SAIL candidates were recorded on site.

Based on the detailed BDAR, the works will have a biodiversity impact. The mitigation measures outlined below will be implemented to reduce the significance of this impact. Remaining unavoidable impacts will be offset in accordance with the Biodiversity Offsets Scheme.

The residual unavoidable impacts of the proposed development were calculated in accordance with the BAM by utilising the Biodiversity Assessment Method Credit Calculator (BAM-C).

The number of ecosystem credits required for the development is outlined below:

Table 6-3 | Ecosystem Credits Required

Plant Community Type	Zone Name in BAM Calculator	Impact Area (ha)	Current Vegetation Integrity Score	Future Vegetation Integrity Score	BC Act Status	Ecosystem Credits Required
PCT 751: Brush Box - Tuckeroo littoral rainforest on coastal headlands of the NSW North Coast Bioregion	751_Poor_Moderate	0.56	54.7	0	None	15
PCT 1235: Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion	1235_Poor_Moderate	0.05	37.3	0	None	1

Plant Community Type	Zone Name in BAM Calculator	Impact Area (ha)	Current Vegetation Integrity Score	Future Vegetation Integrity Score	BC Act Status	Ecosystem Credits Required
PCT 1064: Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion	1064_Poor_Moderate	1.5	48.7	0	None	29

The unavoidable impacts to the Southern Myotis (*Myotis macropus*), Common Planigale (*Planigale maculata*) and Wallum Froglet (*Crinia tinnula*) habitat, as well as the removal of Stinking Cryptocarya (*Cryptocarya foetida*) individuals will also be required to be offset. The number of species credits required to compensate the loss of these species and associated habitat are provided below:

Table 6-4 | Species Credits Required

Species	BCA Status	Zone	Individuals/Area	Biodiversity Risk Weighting	Species Credits Required
Southern Myotis (<i>Myotis macropus</i>)	V	1, 2, 3, 4	2.07 ha	2	46
Wallum Froglet (<i>Crinia tinnula</i>)	V	2, 3, 4	0.39 ha	1.5	5
Common Planigale (<i>Planigale maculata</i>)	V	1, 2, 3, 4	2.07 ha	2	46
Stinking Cryptocarya (<i>Cryptocarya foetida</i>)	V	N/A	11 (count)	2	22

Mitigation Measures – Biodiversity

- All work relating to vegetation clearing and working within proximity to vegetation to be retained is to be undertaken in accordance with a Vegetation Management Plan (VMP) to be prepared as a part of the CEMP prior to the commencement of works.
- The CEMP will include a weed management protocol to ensure weeds are not spread into retained areas.
- Construction staff will delineate the trees / clearing footprint in accordance with the BDAR prior to undertaking clearing works.
- Adequate tree protection / no-go zones are to be maintained around retained trees / vegetation to ensure tree removal and broader construction works do not damage retained vegetation, in accordance with Australian Standard AS4970-2009, Protection of trees on development sites.
- Any pruning required for the proposal must be in accordance with Australian Standards AS4373-2007 Pruning of amenity trees.
- Site specific drainage, sediment control measures must be installed prior to undertaking works, to minimise silt laden runoff.
- Where construction works or movement of materials are considered likely to damage trees (trunks, branches or roots), precautionary measures including trunk and branch protection in line with Section 4 of AS4970-2009 would be installed.

- *No construction materials, stockpiles, or construction equipment including heavy vehicles and machinery shall be located or parked within the drip line of trees adjacent the project.*
- *Branches or vegetation permitted to be removed should be felled towards cleared areas and away from vegetation to be retained.*
- *Within the designated development/construction zone, identification of areas to be cleared is to be pre-assessed by an experienced ecologist/wildlife spotter/catcher. This pre-assessment shall allow for an inventory of fauna habitat components (i.e. birds' nests, loose rocks providing reptile refuge, ground logs etc.) to be undertaken prior to felling and construction works. A wildlife spotter catcher would be utilised during all phases of clearing of the site to ensure safe dispersal and relocation of native fauna into neighbouring retained vegetation within the locality.*
- *Stockpile sites would be located in existing cleared areas away from drains and surface water flows and protected with an upslope diversion bund and down slope sediment fencing (if required).*
- *WIRES are to be contacted on 1300 094 737 in the unlikely event that fauna become harmed during works.*

6.4 Flooding

A Sandhills Wetland Byron Bay – Flood Impact Assessment (BMT, 2023) forms part of the information package supporting this EIS.

Assessment of the potential flood impact of the development included modelling used to simulate the 18%, 10%, 5%, 2% and 1% Annual Exceedance Probability (AEP) and Probable Maximum Flood (PMF) design flood events under current climate conditions and including a number of future climate change scenarios.

There is an existing open channel that runs through the site, from east to west. The open channel drains into a piped drainage network on Cowper Street, which drains to an ocean outlet at Clarkes Beach. The limited capacity of this outfall causes significant flooding at the existing playing fields at Cowper Street and the surrounding properties.

Flooding across the site is as a result of local runoff flowing along the open drain. Most of the flooding on site occurs to the south of the open drain.

Peak flood levels throughout the site are fairly consistent, with limited flood gradient across the site. Similar flood levels are experienced to the west, between Cowper Street and Tennyson Street. The water levels to the west of Tennyson Street are typically lower for all events except the PMF, as Tennyson Street acts as a weir.

The modelling of the developed site indicates that, during the 18% AEP design flood event, flood waters are contained within the wetland area. From the 10% AEP design flood event, there is flow breaking out of Wetland Cell3. From the 5% AEP design flood event, there is also break out flow from the west of Wetland Cell 2 and between Wetland Cells 1 and 2.

Similar to the existing case, peak flood levels throughout the site are fairly consistent, with limited flood gradient across the Site.

The wetland areas act as storage basins, typically slowing the flood water down as it travels through the site. The wetlands influence the time of the flood level peak between Cowper and Tennyson Streets in the 1% AEP design flood event.

The existing flood hazard across the site is predominantly H2 (i.e., unsafe for small vehicles), with areas of higher flood hazard along the open channel. Upstream of the site, the flood hazard is predominantly H3 (i.e., unsafe for all vehicles, children and the elderly).

Downstream of the site, the flood hazard is predominantly H1 (i.e., relatively benign flood conditions). There are pockets of higher hazard to the west of Cowper Street and between Middleton Street and Tennyson Street.

The modelling of the developed site indicates that, within the site boundary, the flood hazard increases, with a large area of H4 (i.e., unsafe for all people and vehicles). This is a result of the increased depth associated with the new open water areas.

The increase in flood hazard is contained within the constructed wetland cells.

Downstream of the site, there is a decrease in the extent of the areas of higher hazard. This decrease is observed in both pockets of the higher hazard, i.e., to the west of Cowper Street and between Middleton and Tennyson Streets.

Overall, the proposed wetland restoration results in a decrease in flood levels and extent outside of the site boundary for events up to and including the 1% AEP design flood event. For events up to and including the 10% AEP design flood event, the decrease in peak flood levels is seen to occur between Cowper and Tennyson Streets and in the overland flow path to the east of the site. In events between the 5% and 1% AEP design flood events, the decrease in flood level also extends between Tennyson and Fletcher Streets.

The PMF event overall shows no change in peak flood levels off site.

6.5 Coastal Hazard

A *Coastal Impact Assessment* (BMT, 2022) forms part of the information package supporting this EIS, providing an assessment of the potential impacts of coastal processes and coastal hazards, including potential impacts of sea level rise, on and arising from the proposed Sandhills Wetland.

The coastal processes that shape the coastline of Byron Shire have been the subject of numerous studies over the past twenty years. The 2013 assessment "*Byron Shire Coastline Hazards Assessment Update*" by BMT WBM is considered to be the most comprehensive of these and has subsequently formed the basis of several management and hazard mitigation plans.

Coastal processes (natural and human influenced) are the principal source of hazard in the coastal zone. Coastal processes and their interactions include:

- long term evolution and regional spatial behaviour of the coastal system;
- waves and storms, and variability in the wave climate from large scale climatological patterns such as El Nino- La Nina over seasonal, inter-annual and decadal time scales;
- elevated water levels, which includes tides, storm surge, wave set up and wave run-up;
- longshore and cross-shore sediment transport driven by waves and currents; and
- projected sea level rise and climate change impacts and their interaction and impacts upon all of the coastal processes described above.

Coastal hazards arise where coastal processes interact with the use and development of coastal land and assets, or where human development has impeded natural coastal processes. The major coastal hazards of note in the vicinity of Clarkes Beach comprise:

- beach erosion, relating to periods of intense storminess over seasons to years, and associated dune slope instability;
- long-term recession, relating to a long-term sediment deficit (e.g., at the Byron Bay Embayment), and due to both prevailing sediment deficits and sea level rise in the future; and
- coastal inundation associated with high tides combined with storms, wave run-up and sea level rise that may overtop coastal barriers.

Historically a sand mining site, aerial imagery from the 1960's does not indicate the presence of any watercourses discharging to the dune system. Presently, the only "watercourses" reaching the beach and penetrating the dune system are piped stormwater outlets. While these outlets are unable to meander, stormwater jetting from the outlets can result in occasional localised scour of the dune system through ponding and/or meandering of the discharged flow along the upper beach.

This local scour has been captured in previous erosion assessments through the photogrammetric analysis of the natural short to medium-term variability of the shoreline.

The “best estimate” erosion recession at Clarkes Beach is 43m at 2050 and 91m at 2100. The Sandhills site is located landward of the dune system of Clarkes Beach, and based on imagery captured in July 2022, was more than 100m inland of the dune toe.

Overall, coastal erosion hazards are not expected to impact on the Sandhills site to the year 2100.

To reach the Sandhills site, coastal inundation would need to either overtop the coastal dune or penetrate via the local drainage system. The NSW Beach profile database indicates that in 2021, the dunes in the vicinity of Clarkes Beach had a crest height in excess of 7m AHD, and elevations inland of the dune at Clarkes Beach are in the order of 6m AHD.

Under sea level rise scenarios to 2100 (0.8m sea level rise), overtopping of the dune by astronomical tides is improbable, with the future projected HAT level being approximately 2.0m AHD.

6.6 Traffic and Transport

6.6.1 Existing Network

Lawson, Marvell, and Tennyson Street are the main distributor roads that surrounds the subject site. Carlyle and Cowper Streets are classified as local streets and Massinger Street is classified as a collector road (see **Figure 6-1**). The posted speed limit is 50km/hr.

Existing footpaths and bike paths are provided along Lawson, Tennyson and Marvel Streets and Gilmore Avenue. The Cowper Street walkway will be closed during the construction works. Pedestrians will be guided around the proposed works site through the use of signs and 1.8m site fence.

6.6.2 Construction Traffic

It is anticipated that the majority of the pre-cast materials will be sourced from the south (e.g., Ballina, Lennox Head) and it is expected that majority of the construction trucks will utilise the M1 Highway as the preferred route to the subject site.

Construction vehicle movements will occur to and from the site through the Byron Bay town centre from Ewingsdale Road and Bangalow Road.

A combination of truck and vehicle types will be used during the construction of the project. Typical vehicle traffic is expected to comprise of the following vehicles:

- Light vehicles for the movement of construction personnel, including contractors, the project labour force and management staff;
- Small and medium vehicles for machinery delivery; and
- Heavy vehicle movements for the delivery and removal of construction machinery and materials, spoil and waste.

The largest vehicle used for construction activities will be 16.5m truck and dog.

The number of truck movements required for the construction phase for the site has been assessed based on the estimated bulk earthworks volumes. These truck movements are summarised in Table 6-5.

Table 6-5 | Estimate of Truck Movements

Material	Volume (m ³)	No of Truck Loads*	Days
Topsoil – likely to be reused on site	5,070	338	10
Excess Spoil – disposed of off site	14,706	980	50
Mulch – likely to be reused on site	3,819	255	10

TOTAL	23, 595	1,573	70
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* based on 16.5m truck and dog

As indicated, topsoil and mulch are likely to be reused on site. The movement of that material will therefore not generate truck movements on the local road network.

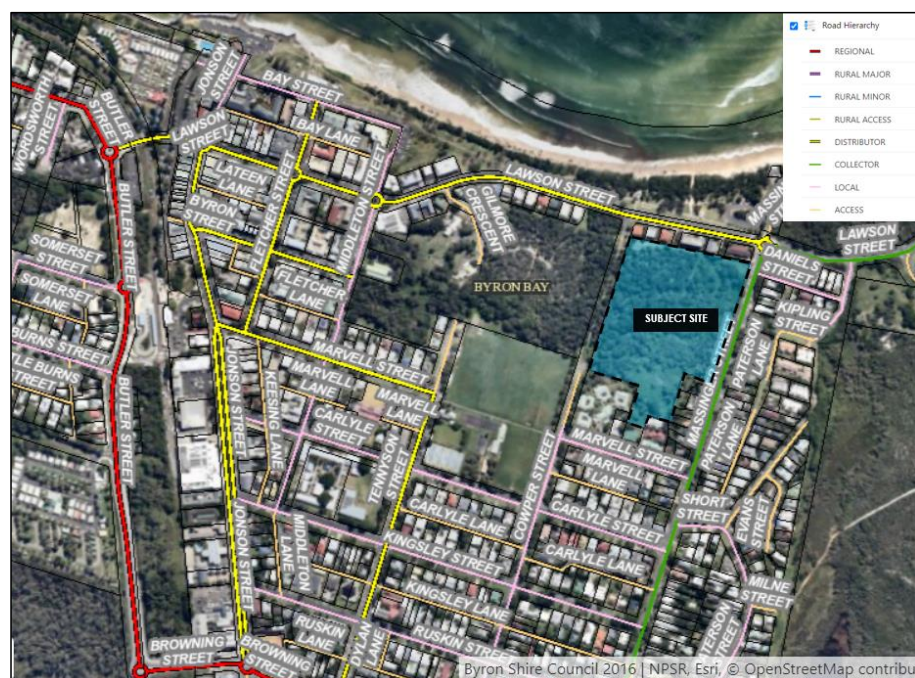


Figure 6-1 | Local Road Hierarchy (Source: Byron Shire Council)

Mitigation Measures – Traffic

- A Traffic Control Plan (TCP) will be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW.
- CEMP to include a Traffic Management Plan to guide the movement of all vehicles used in the construction, including trucks and works vehicles.
- Accredited traffic controllers will be in place to manage all site movements for the duration of the project.
- Loads within trucks will be securely covered on all public roads.
- Water carts will be used on local roads adjacent to the site to minimise dust.

6.7 Noise and Vibration

A noise and vibration impact assessment was undertaken as part of the preparation of the Construction Noise and Vibration Management Plan (Acousticworks, 2023), submitted in support of this EIS.

The assessment considered potential impacts on residential and holiday accommodation buildings in Lawson and Massinger Streets and the aged care facility located on the site's southern boundary at 29-33 Marvel Street.

The noise assessment compared predicted noise levels associated with construction of the project with the relevant criteria within the NSW Interim Construction Noise Guideline 2009. The noise criteria assessed at residential properties are (during standard working hours):

- Noise affected – Background level + 10dB LAeq (15min)

The noise affected level represents the point above which there may be some community reaction to noise.

Where the predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level.

- Highly noise affected – 75dBA

The highly noise affected level represents the point above which there may be strong community reaction to noise.

Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur.

The noise assessment shows that the predicted noise impacts associated with earthworks and construction are likely to be above the noise affected criteria, but within the highly affected noise limit at all nominated receivers.

A number of recommendations are made, which are refined in the Construction Noise Management Plan, which will form part of the Construction Environmental Management Plan (CEMP) for the works.

Adherence to the requirements of the Management Plan will ensure that construction of the wetland will not result in significant noise impacts.

In relation to vibration, the methods used during construction have the potential to exceed the relevant vibration limits at nominated receivers. Dilapidation assessments will be undertaken at three premises, including the adjacent aged care facility, prior to construction.

The vibration management plan outlined in the Construction Noise and Vibration Management Plan (Acousticworks, 2023) will form part of the overall CEMP for the works, to ensure that the project does not result in significant vibrational impacts.

Mitigation Measures – Noise and Vibration

- CEMP to adopt all recommendations of the Construction Noise and Vibration Management Plan (Acousticworks, 2023)
- Notification to all residents and owners of properties adjoining the site of the works (letterbox drop or equivalent) including the anticipated duration of such works prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/updates associated with the proposed works.
- Noise complaints will be recorded, including suitable identification/ description of the noise source (e.g., continual/ impulsive) and general location of the complaint. Any noise complaints will be investigated and actioned as required.
- Construction working hours will be restricted to the normal daytime construction hours as specified by the EPA being:
 - 7 am to 6 pm Monday to Friday.
 - 8 am to 1 pm Saturdays.
 - No works will be undertaken on Sundays or Public Holidays.
- Works may be undertaken outside these hours where:

- *The delivery of materials is required outside these hours by the Police or other authorities.*
- *It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm.*
- *Dilapidation assessments will be undertaken as recommended in the Construction Noise and Vibration Management Plan (Acousticworks, 2023)*

6.8 Waste

A *Waste Management Plan* (ENV 2023) forms part of the information package supporting this EIS and:

- Details the waste handling procedures, including transport, identification, receipt, stockpiling, and quality control including off-site reuse and disposal;
- Details the measures that will be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21;
- Details the type and quantity of waste to be generated during the construction works; and
- Demonstrates minimal adverse health, environmental and safety impacts associated with the handling and disposal of waste and recycled material.

The primary waste associated with the project is approx. 15,000m³ of excavated soil material. Excavated soil will be managed in accordance with the Acid Sulfate Soil Management Plan (ASSMP).

It will be reused as much as practically possible to meet the WARR objectives to divert waste from landfill, with treated and validated material to be reused on site and excess material is to be stockpiled for beneficial reuse offsite.

Soil designated for onsite reuse will be limed at the rate prescribed in the ASSMP. All material to be reused offsite is subject to a site-specific exemption sought from the NSW EPA.

Any soil unsuitable for reuse will be disposed offsite untreated to a suitably licenced facility (e.g., Eco Earth at Jacobs Well, QLD) pending successful soil disposal permits and cross border consignments.

Stockpiled soil will be managed in accordance with the Blue Book – Volume 1, *Managing Urban Stormwater, Soils and Construction*.

The project will also generate organic waste material associated with the clearing works. Trees and large organics will be mulched onsite and used for landscaping purposes. All other organic material (including weeds and excess organic material) not suitable for mulching will be separated into an organics skip bin or trucks and collected by a waste contractor to be composted at the Myocum Resource Recovery Centre.

There is also the potential for organic material to be mulched and applied to other council projects.

All wastes will be managed in accordance with the recommendations and procedures outlined in the Waste Management Plan.

Mitigation Measures – Waste

- *Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day using skip bins.*
- *Waste is to be temporarily stockpiled at the site and transported to a Council waste handling facility.*
- *Work to be undertaken in accordance with the Protection of the Environment Operations (Waste) Regulation 2014.*

6.9 Bush Fire

The site is mapped as bush fire prone land, with Council's mapping shown below in **Figure 6-2**. As shown, the majority of the construction site is mapped as Vegetation Category 1.



Figure 6-2 | Bush Fire Prone Land Mapping

Given this mapping, NSW Rural Fire Service (RFS) were contacted in 2021 to request advice regarding the project. RFS provided the following advice:

- The subject land is mapped as bush fire prone by Council;
- The NSW RFS has no objection to the project; The Environmental Assessment shall review the proposed vegetation outcomes from the site on any adjoining land that has development opportunities; and
- The project shall not directly increase the bush fire risk to those identified adjoining properties.

The adjoining properties most at risk are those to the north of the site, fronting Lawson Street. There is currently a 3m cleared grassed strip along the northern side of the Sandhills site providing a minor fire break for those properties.

The proposed development will include the clearing of existing vegetation, to be replaced by the wetland cells and associated macrophyte plantings. This will result in a significant reduction in bush fire risk as the resulting vegetation is inherently less flammable.

Mitigation Measures – Bush Fire

- A fire extinguisher is to be kept on site throughout the proposed activity.
- All work involving an open flame or spark out in the open is to cease during a total fire ban.
- The Construction Contractor is to check the Fire Danger Rating for the Far North Coast Fire Area: 1 prior to any work involving an open flame or spark out in the open commences.

- *Construction Contractor is to make sure all staff are aware of evacuation route.*

6.10 Air Quality

An assessment of the potential impacts of construction to air quality was undertaken by EMM (2023).

The risk of significant dust generation was determined to be low for construction, and medium for earthworks and track-out. For human health impacts, the risk was determined to be negligible for construction, and low for earthworks and track-out. For ecological impacts, the risk was also determined to be negligible for construction, and low for earthworks and track-out.

Given the nature of the project (i.e., a wetland area), it is likely that much of the material handled during earthworks and construction will be wet and coarse in nature (e.g., sand), and therefore the risk ratings for these activities are considered to be conservative.

It was considered that the operational impacts of the project on air quality, as well as potential sources of odorous air pollutant emissions, would be negligible.

Mitigation Measures – Air Quality

- *Adjacent residents are to be notified of the upcoming work, prior to undertaking the activity.*
- *Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation.*
- *The Construction Contractor would observe local meteorological conditions and predicted forecasts daily and prepare site for extreme weather events (i.e., high winds).*
- *All disturbed areas or stockpiles would be wet down and/or stabilised as soon as practicable to prevent or minimise windblown dust.*

6.11 Visual Impacts

The construction of the wetland cells will alter the existing visual environment from a somewhat 'wild' bushland environment, to a more managed, but still vegetated space. Most of this change, however, will occur within the site, with the majority of the exposed site edges remaining vegetated as current.

The main areas of public view into the wetland will be from a section of Massinger Street and the northern end of Cowper Street.

There are no buildings involved and so, while the visual environment will be altered, it will still largely present as a natural area. Overall, therefore, the project will not result in any significant visual impacts.

Mitigation Measures – Visual Environment

- *Existing mature vegetation outside of the works footprint to be protected and maintained, particularly around the road edges and property boundaries.*

6.12 Social Impact Assessment

6.12.1 Potential social impacts

Given the nature of this project, the potential for social impacts arise primarily during the construction stage. The following construction activities have the potential to generate social impacts associated with noise, traffic and dust:

- Site establishment;
- Clearing and grubbing;
- Excavation and material transport; and

- Planting.

The impacts will be most noticeable for residents in the immediate area, fronting Lawson Street to the north and Massinger Street to the east. Potential traffic impacts could be experienced across a wider area of the local road network, depending on the receiving site chosen for the excavated material.

Once established, the artificial wetlands will not generate noise or dust issues but are likely to result in positive social impacts associated with the increased passive recreation opportunities, reduced flood impacts and improvement in local stormwater quality, particularly at the Clarkes Beach outlet.

The positive social impacts will be experienced more widely by residents, visitors and business owners in the Byron Bay Town Centre.

6.12.2 Impact Assessment

Based on the Social Impact Assessment Guideline (DPE, Feb 2023), it is considered that the level of assessment for this project is **minor**, in that the project may result in minor, manageable impacts during the construction stage only.

Based on the Guideline, the impacts are considered to be:

- possible – a medium probability depending on factors such as weather;
- of limited extent – primarily affecting adjacent residents/ occupiers; and
- of a minor magnitude – for a reasonably short time, for a relatively small number of people.

The potential impacts can be mitigated through construction management measures, outlined above and in the supporting reports.

Prior to commencement of construction a Construction Environmental Management Plan (CEMP) will be prepared by the Contractor outlining all mitigation measures, including implementation responsibilities, monitoring and reporting requirements.

It is concluded that, with successful implementation of the CEMP, the project will not result in significant social impacts.

6.13 Red Imported Fire Ants

NSW DPI has issued an Emergency Order in December 2023, which places restrictions on the movement of fire ant carrier materials, including organic mulch, soil and anything with soil on it, hay and baled material, potted plants, turf, agriculture, or earth moving machinery, mining or quarry materials, sand and gravel, into NSW from the fire ant infested areas of QLD and South Murwillumbah.

The Emergency Order refers to the following control areas:

- The NSW fire ant movement control area is the 5km radius around south Murwillumbah shown red on the map located at <https://www.dpi.nsw.gov.au/biosecurity/insect-pests/fire-ants> and shown in Figure 6-3 below.
- The South Queensland fire ant movement control area is the 5km radius around south Murwillumbah shown yellow on the DPI map and shown in Figure 6-3 below.

Fire ants have been found 5.5 km from the NSW border at Tallebudgera in Queensland. They have also been found at Mermaid Waters, Tabooba, Kleinton, Carrara, Worongary, Mudgeeraba and Innisplain. The closeness of the South East Queensland infestation and infestation into South Murwillumbah makes fire ants one of the highest biosecurity risks to NSW.

Fire ants are regulated as a prohibited matter under the *NSW Biosecurity Act 2015*. Their possible movement and spread in hay or straw bales, turf, agricultural and earth moving equipment, organic mulch including manure, soil, potted plants, sand, gravel and quarrying materials is regulated under the *Biosecurity (Fire Ant) Emergency Order 2023*. Carrier materials from the fire ant infested area map below are subject to the requirements in the Order.

Material imported to site for the works from risk areas have potential to spread the fire ant further into NSW presenting further biosecurity risk. Measures are therefore required to ensure the works do not increase risks associated with the fire ant spread in the region.

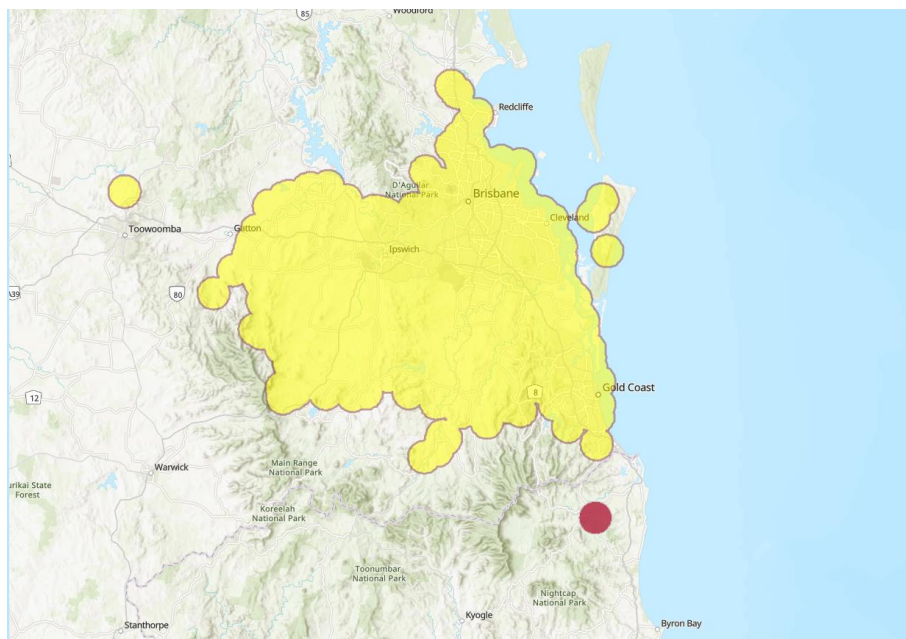


Figure 6-3 | Fire ant infested area map (source: NSW DPI)

It is not expected that there will be a need to import material from potential infestation areas given that soil and mulch will be reused from existing onsite material as much as possible. However, the following recommended safeguards will be implemented to reduce the risk of bringing fire ants into the site.

Red Imported Fire Ants - Recommended Safeguards:

- Prior to the use of materials and equipment that has travelled through or from a biosecurity zone, Project Managers are to ensure that contractors supply the necessary certificates for any of the materials and equipment. The biosecurity zones are shown at the NSW DPI Alert <https://www.dpi.nsw.gov.au/biosecurity/insect-pests/fire-ants>
- Moving fire ant carriers from the fire ant infested area of Queensland into NSW (the Emergency Zone) must:
 - Follow the requirements as specified for each fire ant carrier in part 2 of the emergency Order. View the [Biosecurity \(Fire Ant\) Emergency Order \(3\)](#)
 - Obtain an approved biosecurity certificate for organic mulch, soil, compost, manure, growing media, hay, chaff, silage, potted plants, turf, agriculture and earthmoving equipment, and mining quarrying materials.
 - Complete the record of movement Declaration form prior to the carriers moving into NSW
- If red imported fire ants are suspected at or adjoining the works areas, stop work immediately, notify BSC of the issue and commence the following:

- *Suspicious sightings of red imported fire ants or their mounds that have been identified within a site must be reported to NSW Department of Primary Industries immediately on 1800 680 244 or via their online form <https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants>.*
- *If red imported fire ants are suspected, do not disturb the ants or nests and make records of the ants and nest (including photographic record) as outlined in the NSW DPI Alert <https://www.dpi.nsw.gov.au/biosecurity/insect-pests/fire-ants>*
- *If red imported fire ants are suspected at or adjoining the works areas, works may not commence until:*
 - *DPI will work with the National Fire Ants Eradication Program to search the surrounding areas, treat the ants and stop their spread, at no cost to the owners or occupiers.*
 - *A temporary requirement to only move certain materials and items off the property under permitted conditions could be put in place while the ants are controlled.*
 - *The ants are treated and monitored until it is clear they had been eradicated.*

6.14 Environmental Risk Assessment

The following table summarises the environmental risks of the project before and after mitigation.

Table 6-6 | Environmental Risk Assessment

Aspect	Project Phase	Potential Impact	Mitigation Measures	Timing	Responsibility	Risk Before Mitigation	Risk After Mitigation
Cultural Heritage	Construction	Destruction of relics and items	Aboriginal Heritage Impact Permit (AHIP) Inadvertent Discovery Finds Protocols included in CEMP Ongoing consultation with local Aboriginal Community Monitoring of works and community collection by RAPs Excavator worker inductions	Before and during construction	Project Manager/ Contractor	Medium	Low
Soil Contamination	Construction	Exposure of contaminated soils	Pre-EIS detailed soil sampling and analysis Unexpected Finds Protocol in the CEMP	Before EIS and during construction	Project manager/Contractor	Low	Very Low
Acid Sulfate Soils	Construction	Exposure of potential or actual acid sulfate soils	Implementation of Acid Sulfate Soil Management Plan actions	During construction	Project Manager/ Contractor	Medium	Low
Water Quality	Construction	Release of sediment into local drainage lines	Construction Water management Plan actions	During construction	Project Manager/ Contractor	Medium	Low

Aspect	Project Phase	Potential Impact	Mitigation Measures	Timing	Responsibility	Risk Before Mitigation	Risk After Mitigation
	Operation	Low quality stormwater discharge	Maintenance of wetland cells and plantings	Ongoing	Council	Medium	Low
Biodiversity	Construction	Loss of threatened communities, flora and fauna species	Offsets as recommended in the BDAR Weed management protocol as part of CEMP Planting in accordance with AWC design and maintenance of plants	During construction	Project Manager/ Contractor/ Council	High	Medium
Noise and Vibration	Construction	Unacceptable noise and vibration at nearby residential receivers	Recommendations of Construction Noise and Vibration Management Plan to be implemented through the CEMP	During construction	Project Manager/ Contractor	Medium	Low
Dust	Construction	Dust generation during earthworks and construction	Recommendations of Construction Air Quality Impact Assessment to be implemented through the CEMP	During construction	Project Manager/ Contractor	Medium	Low

7 Justification and Conclusion

7.1 Suitability of the Site

The subject site was extensively altered by sand mining activities during the 1950s and 1960s. Prior to that, the site was a low-lying wetland area behind the dunal ridge.

The site has been left to regenerate since completion of sand mining, as described above. Drainage lines have formed through the property in an unmanaged way over time.

Public access and unauthorised camping has continued within the site over years and parts of the site are degraded through these activities.

Overall, the site is suitable to the proposed activity, given that it will mimic and enhance the natural system that was in place prior to original site disturbances.

7.2 Impacts and Mitigation

Environmental safeguards and management measures outlined in this EIS will be implemented during construction and operation of this activity. The safeguards and management measures will minimise any potential adverse impacts arising from the activity on the surrounding environment. The safeguards and management measures are summarised below.

Table 7-1 | Mitigation Measures

Safeguards / Mitigation Measures
1. General
A CEMP will be prepared prior to any works commencing. The CEMP will include recommendations from all specialist supporting studies and the mitigation measures listed in this Table.
2. Cultural Heritage
Recommendation 1: Aboriginal community consultation
Byron Shire Council should continue to consult with the Aboriginal community in regard to the Project in accordance with the <i>Aboriginal cultural heritage consultation requirements for proponents 2010</i> (DECCW, 2010b) and any conditions of the operation AHIP. Consultation may include, but is not limited to:
<ul style="list-style-type: none">• Review of the ACHAR with AR.• Review of the AHIP testing methodology within the AR.• Participation in excavation program.• Finalisation of ACHAR and AR.• Long-term storage/reburial of any material recovered during excavations.• Potential operational AHIP application/s.• Unexpected finds protocols put into place.• Development of any interpretation material if required.
Recommendation 2: Application for test AHIP
The Proponent applied to Heritage NSW for an AHIP to test under s.90 of the NPW ACT 1974 to allow harm to Aboriginal objects by archaeological testing.
The AHIP to test application will include mitigation strategies, as well as a methodology for an archaeological testing program to further investigate the potential for intact Aboriginal objects

Safeguards / Mitigation Measures

and human remains in accordance with Requirement 14 of the DECCW (2010a) *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. The test excavation methodology must be developed in consultation with the RAPs.

Long-term storage of any artefacts located during the test excavation process would be discussed with all of the RAPs prior to the test excavation being undertaken. The long-term disposition of collected artefacts may include reburial onsite or may be managed under a Care and Control Agreement under s.85A(1)(c) of the National Parks and Wildlife Act 1974. Temporary storage would be in a locked cupboard at the Niche Environment and Heritage Office, Port Macquarie, NSW.

Recommendation 3: Archaeological testing program

An archaeological excavation program was undertaken to provide evidence regarding the extent, nature, and significance of any subsurface archaeological deposits within the site. See Appendix E - Test Excavation Report.

Recommendation 4: Application for operational AHIP

An application for an operational AHIP will be required for the Subject Area. Conditions of this AHIP should include monitoring of the works and community collection by representatives of the RAPs.

A Care and Control Agreement undertaken in collaboration with the RAPs will be required to determine the keeping place of Aboriginal objects collected during the monitoring/cultural collections.

Recommendation 5: Worker inductions

All workers should be inducted into the Subject Area, so they are made aware of their obligations under the NPW Act 1974 and any conditions of any operational AHIP prior, during and, after construction activities.

Recommendation 6: Human remains - Stop work provision

In the event that suspected human remains are encountered during the archaeological test excavation or the proposed works all activity and work in the area that may cause further impact, must cease immediately and the following measures undertaken:

- The location, including a 20m curtilage, should be secured using barrier fencing to avoid further harm.
- The NSW Police must be contacted immediately.
- No further action is to be undertaken until the NSW Police provide written notification to the Proponent.
- If the skeletal remains are identified as Aboriginal, the Proponent must contact the following:
 - The DPIE Enviroline on 131 555.
 - The representatives of the RAPs.
- No works are to continue until Heritage NSW provides written notification to the Proponent.

Recommendation 7: Unexpected finds procedure

The following Unexpected Finds Procedure should be put in place as a minimum response in the unlikely event of the identification of artefacts within the Subject Area:

- Work in the surrounding area is to stop immediately.
- A temporary fence is to be erected around the Aboriginal cultural heritage site, with a buffer distance of at least 5m from the known outer extent of the Aboriginal cultural heritage site.
- An appropriately qualified archaeological consultant is to be engaged in collaboration with a RAP representative to identify the material.

Safeguards / Mitigation Measures

- Should the material be confirmed as an Aboriginal object or archaeological site, facilitate, in co-operation with the local Aboriginal community and the appropriate authorities:
 - The recording and assessment of the finds.
 - Compliance with any legal requirements and Heritage NSW directions.
 - The development and implementation of appropriate management strategies based on an assessment of significance of the finds.
- Recommencement of ground disturbance works may only resume once legal requirements are fulfilled.

3. Soil & Water

- Site works will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book (4th Edition) on erosion and sediment control and Safe Work Australia 'Excavation Code of Practice (March 2015).
- All required erosion and sediment controls would be in place prior to the commencement of work and maintained until all works are completed, in accordance with the NSW Blue Book.
- Excavated soils will be managed in accordance with the Acid Sulfate Soils Management Plan (ENV, 2023)
- Construction water will be managed in accordance with the recommendations in Construction Water Management Plan (ENV, 2023).
- CEMP is to contain suitable unexpected finds protocols and waste handling procedures for managing contaminated soils. This should include, as a minimum:
 - Works to proceed with caution and cease immediately if any potential source of contamination are encountered during development, then works should be halted until confirmation of the presence of contamination is undertaken. In instances where contamination is confirmed, remediation in accordance with a Council approved Remediation Action Plan would be required.

Excess spoil to be disposed offsite from the proposed works will need to be classified pursuant to the EPA Waste Classification Guidelines. Relevant permits may need to be obtained for such waste in accordance with the POEO Act 1997 and the relevant guidelines.

4. Biodiversity

- All work relating to vegetation clearing and working within proximity to vegetation to be retained is to be undertaken in accordance with a Vegetation Management Plan (VMP) to be prepared as a part of the CEMP prior to the commencement of works.
- The CEMP will include a weed management protocol to ensure weeds are no spread into retained areas.
- Construction staff will delineate the trees / clearing footprint in accordance with the BDAR prior to undertaking clearing works.
- Adequate tree protection / no-go zones are to be maintained around retained trees / vegetation to ensure tree removal and broader construction works do not damage retained vegetation, in accordance with Australian Standard AS4970-2009, Protection of trees on development sites.
- Any pruning required for the proposal must be in accordance with Australian Standards AS4373-2007 Pruning of amenity trees.
- Site specific drainage, sediment control measures must be installed prior to undertaking works, to minimise silt laden runoff.

Safeguards / Mitigation Measures

- Where construction works or movement of materials are considered likely to damage trees (trunks, branches or roots), precautionary measures including trunk and branch protection in line with Section 4 of AS4970-2009 would be installed.
- No construction materials, stockpiles, or construction equipment including heavy vehicles and machinery shall be located or parked within the drip line of trees adjacent the project.
- Branches or vegetation permitted to be removed should be felled towards cleared areas and away from vegetation to be retained.
- Within the designated development/construction zone, identification of areas to be cleared is to be pre-assessed by an experienced ecologist/wildlife spotter/catcher. This pre-assessment shall allow for an inventory of fauna habitat components (i.e. birds' nests, loose rocks providing reptile refuge, ground logs etc.) to be undertaken prior to felling and construction works. A wildlife spotter catcher would be utilised during all phases of clearing of the site to ensure safe dispersal and relocation of native fauna into neighbouring retained vegetation within the locality.
- Stockpile sites would be located in existing cleared areas away from drains and surface water flows and protected with an upslope diversion bund and down slope sediment fencing (if required).
- WIRES are to be contacted on 1300 094 737 in the unlikely event that fauna become harmed during works.

5. Traffic

- A Traffic Control Plan (TCP) will be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW.
- CEMP to include a Traffic Management Plan to guide the movement of all vehicles used in the construction, including trucks and works vehicles.
- Accredited traffic controllers will be in place to manage all site movements for the duration of the project.
- Loads within trucks will be securely covered on all public roads.
- Water carts will be used on local roads adjacent to the site to minimise dust.

6. Noise and Vibration

- CEMP to adopt all recommendations of the Construction Noise and Vibration Management Plan (Acousticworks, 2023)
- Notification to all residents and owners of properties adjoining the site of the works (letterbox drop or equivalent) including the anticipated duration of such works prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/ updates associated with the proposed works.
- Noise complaints will be recorded, including suitable identification/ description of the noise source (e.g., continual/ impulsive) and general location of the complaint. Any noise complaints will be investigated and actioned as required.
- Construction working hours will be restricted to the normal daytime construction hours as specified by the EPA being:
 - 7 am to 6 pm Monday to Friday.
 - 8 am to 1 pm Saturdays.
 - No works will be undertaken on Sundays or Public Holidays.

Safeguards / Mitigation Measures

- Works may be undertaken outside these hours where:
 - The delivery of materials is required outside these hours by the Police or other authorities.
 - It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm.
- Dilapidation assessments will be undertaken as recommended in the Construction Noise and Vibration Management Plan (Acousticworks, 2023)

7. Waste

- Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day using skip bins.
- Waste is to be temporarily stockpiled at the site and transported to a Council waste handling facility.
- Work to be undertaken in accordance with the Protection of the Environment Operations (Waste) Regulation 2014.

8. Bushfire

- A fire extinguisher is to be kept on site throughout the proposed activity.
- All work involving an open flame or spark out in the open is to cease during a total fire ban.
- The Construction Contractor is to check the Fire Danger Rating for the Far North Coast Fire Area: 1 prior to any work involving an open flame or spark out in the open commences.
- Construction Contractor is to make sure all staff are aware of evacuation route.

9. Air Quality

- Adjacent residents are to be notified of the upcoming work, prior to undertaking the activity.
- Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation.
- The Construction Contractor would observe local meteorological conditions and predicted forecasts daily and prepare site for extreme weather events (i.e., high winds).
- All disturbed areas or stockpiles would be wet down and/or stabilised as soon as practicable to prevent or minimise windblown dust.

10. Visual Impact

- Existing mature vegetation outside of the works footprint to be protected and maintained, particularly around the road edges and property boundaries.

11. Red Imported Fire Ants

- Prior to the use of materials and equipment that has travelled through or from a biosecurity zone, Project Managers are to ensure that contractors supply the necessary certificates for any of the materials and equipment. The biosecurity zones are shown at the NSW DPI Alert <https://www.dpi.nsw.gov.au/biosecurity/insect-pests/fire-ants>
- Moving fire ant carriers from the fire ant infested area of Queensland into NSW (the Emergency Zone) must:

Safeguards / Mitigation Measures

- Follow the requirements as specified for each fire ant carrier in part 2 of the emergency Order. View the [Biosecurity \(Fire Ant\) Emergency Order \(3\)](#)
- Obtain an approved biosecurity certificate for organic mulch, soil, compost, manure, growing media, hay, chaff, silage, potted plants, turf, agriculture and earthmoving equipment, and mining quarrying materials.
- Complete the record of movement Declaration form prior to the carriers moving into NSW.
- If red imported fire ants are suspected at or adjoining the works areas, stop work immediately, notify BSC of the issue and commence the following:
 - Suspicious sightings of red imported fire ants or their mounds that have been identified within a site must be reported to NSW Department of Primary Industries immediately on 1800 680 244 or via their online form <https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants>.
 - If red imported fire ants are suspected, do not disturb the ants or nests and make records of the ants and nest (including photographic record) as outlined in the NSW DPI Alert <https://www.dpi.nsw.gov.au/biosecurity/insect-pests/fire-ants>
- If red imported fire ants are suspected at or adjoining the works areas, works may not commence until:
 - DPI will work with the National Fire Ants Eradication Program to search the surrounding areas, treat the ants and stop their spread, at no cost to the owners or occupiers.
 - A temporary requirement to only move certain materials and items off the property under permitted conditions could be put in place while the ants are controlled.
 - The ants are treated and monitored until it is clear they had been eradicated.

7.3 Conclusion

This Environmental Impact Statement (EIS) has been prepared by Planit Consulting Pty Ltd on behalf of Byron Shire Council to consider the environmental effects of the construction of artificial wetlands at the Sandhills Estate in Byron Bay.

The proposed works will significantly improve local water quality, particularly at the Clarkes Beach stormwater outlet and provide additional flood storage to assist in mitigating flooding in the nearby Byron Bay Town Centre. The objectives of the Project are to deliver improved cultural, social, economic and environmental outcomes.

An assessment of relevant legislation and environmental planning instruments has confirmed the proposal is permitted without development consent.

An environmental assessment of the proposal has been undertaken in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). For this proposal, the Byron Shire Council is both a public authority proponent (EP&A Act s.5.3) and the determining authority (EP&A Act s.5.1). The EIS has been prepared in accordance with Clauses 171, 190 and 192 of the *Environmental Planning & Assessment Regulation 2021* (EP&A Regulation).

The proposal is considered to have no long-term adverse environmental impacts and is compatible with surrounding area.

To provide additional environmental safeguards and short-term construction impact mitigation, a suite of measures has been prescribed and consolidated under Section 6 of this EIS.

Overall, it is considered that, having regard to the relevant tests under the NSW and Commonwealth planning frameworks, the proposal should be supported subject to the reasonable and relevant

Environmental Impact Statement

Sandhills Stormwater Management System Project

Byron Shire Council

www.planitconsulting.com.au



safeguards prescribed in Section 6 and any additional matters detailed by NSW Crown Lands when a Short-Term Licence is issued.

Appendix A – SEARs



1 September 2023

Ms Rachel Heath
PO Box 1623
KINGSCLIFF NSW 2487

SEAR 1808

Dear Ms Heath

**Sandhills Wetland Project, Byron Bay
1 Gilmore Crescent, Byron Bay (Lot 457 DP1087879 and Lot 383 DP 728202)
Planning Secretary's Environmental Assessment Requirements (SEAR) 1808**

Thank you for your request for the Planning Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) for the above development proposal. I have attached a copy of these requirements.

These SEARs have been issued on the basis that Council is satisfied the proposal is considered a permissible use within the site.

If other approvals are identified before the Development Application (DA) is lodged, you must undertake direct consultation with the relevant agencies, and address their requirements in the EIS.

If your proposal contains any actions that could have a significant impact on matters of National Environmental Significance, then it will require an additional approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to your proposal, you should contact the Commonwealth Department of Agriculture, Water and the Environment on (02) 6274 1111.

Should you have any further enquiries, please contact Nick Hearfield, Water Assessments, at the Department on (02) 8217-2039 or via nick.hearfield@dpie.nsw.gov.au.

Yours sincerely

A blue ink handwritten signature, appearing to read 'Glenn Snow', with a stylized flourish at the end.

Glenn Snow
Director
Transport and Water Assessments
as delegate of the Planning Secretary

Planning Secretary's Environmental Assessment Requirements

Section 5.1 of the *Environmental Planning and Assessment Act 1979*

Part 8 of the *Environmental Planning and Assessment Regulation 2021*

Application Number	1808
Project	Sandhills Wetland Project
Location	1 Gilmore Crescent, Byron Bay (Lot 457 DP1087879 and Lot 383 DP 728202) in Byron Bay Shire Council Local Government Area
Proponent	Byron Bay Shire Council
Date of Issue	1 September 2023
General Requirements	<p>The Environmental Impact Statement (EIS) must meet the minimum form and content requirements as prescribed by Part 8 of the <i>Environmental Planning and Assessment Regulation 2021</i> (EP&A Regulation) and must have regard to the <i>State Significant Infrastructure Guidelines</i>.</p> <p>Notwithstanding the key issues specified below, the EIS must include an environmental risk assessment to identify the potential environmental impacts associated with the infrastructure.</p> <p>Where relevant, the assessment of key issues below, and any other significant issues identified in the risk assessment, must include:</p> <ul style="list-style-type: none"> - adequate baseline data - consideration of the potential cumulative impacts due to other developments in the vicinity (completed, underway or proposed); - measures to avoid, minimise and if necessary, offset predicted impacts, including detailed contingency plans for managing any significant risks to the environment; and - a health impact assessment of local and regional impacts associated with the development, including those health risks associated with relevant key issues.
Key issues	<p>The EIS must address the following specific matters:</p> <p>1. Key Issues</p> <p>The EIS must include an assessment of potential impacts of the proposed development on the existing environment (including cumulative impacts if necessary) and develop appropriate measures to avoid, minimise, mitigate and/or manage these potential impacts. As part of the EIS assessment, the following matters must be addressed:</p> <ul style="list-style-type: none"> • strategic and statutory context – including:

	<ul style="list-style-type: none"> - justification that the proposed land use is permissible, taking into consideration local and regional strategic planning documents - a justification for the proposal and suitability of the site for the development - a demonstration that the proposal is consistent with relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for inconsistencies - a list of approvals that must be obtained under any other Act or law before the development may lawfully be carried out - if appropriate, likely impacts (both direct and indirect) of the proposed development on adjoining and/or nearby NPWS estate reserved under the National Parks and Wildlife Act 1974 should be considered, with reference to the Developments adjacent to National Parks and Wildlife Service lands Guidelines for consent and planning authorities (DPIE 2020). <ul style="list-style-type: none"> • suitability of the site – including: <ul style="list-style-type: none"> - a justification that the site can accommodate the proposed wetlands, having regard to the scope of the operations and its environmental impacts and relevant mitigation measures - waste management – including: <ul style="list-style-type: none"> - details of waste handling including, transport, identification, receipt, stockpiling and quality control including off-site reuse and disposal - the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21. • hazards and risk – including: <ul style="list-style-type: none"> - an assessment of the risk of bushfire, including addressing the requirements of Planning for Bush Fire Protection 2019 (RFS). Any proposed Asset Protection Zones must not adversely affect environmental objectives (e.g. buffers) - any geotechnical limitations that may occur on the site and if necessary, appropriate design considerations to address this - an assessment of flood risk on the site. The assessment should determine: the flood hazard in the area; address the impact of flooding on the proposed development, and the development's impact (including filling) on flood behaviour of the site and adjacent lands; and address adequate egress and safety in a flood event. - a consideration of any potential human health impacts. • air quality – including: <ul style="list-style-type: none"> - a description of potential sources of air and odour emissions during construction and operation - an air quality impact assessment in accordance with relevant Environment Protection Authority guidelines - a description and appraisal of air quality impact mitigation and monitoring measures. • noise and vibration – including:
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	<ul style="list-style-type: none"> - a description of potential noise and vibration sources during construction and operation, including road traffic noise - a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines - a description and appraisal of noise and vibration mitigation and monitoring measures. <ul style="list-style-type: none"> • soil and water – including: <ul style="list-style-type: none"> - a description of local soils, topography, drainage, landscapes and hydrology and how these features may be changed or impacted as a result of the development - details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the Water Act 1912 and/or the Water Management Act 2000 - an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment - a cut and fill balance for all soil either entering or leaving the site, including assessment that fill materials are of suitable quality and exported materials are disposed of appropriately - details of sediment and erosion controls - a detailed site water balance - an assessment of the potential impacts of the proposal in line with the Natural Resource Access Regulators' Guidelines for controlled activities on waterfront land - an assessment in accordance with ASSMAC Guidelines for the presence and extent of acid sulfate soils (ASS) and potential acid sulfate soils (PASS) on the site and, where relevant, appropriate mitigation measures - an assessment of potential impacts on the quality and quantity of surface and groundwater resources - details of the proposed stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts - characterisation of the nature and extent of any contamination on the site and surrounding area - a description and appraisal of impact mitigation and monitoring measures. • Flooding, Stormwater and Coastal Erosion – including details of <ul style="list-style-type: none"> - potential effect of coastal processes and coastal hazards on the development, considering the NSW Coastal management framework, including potential impacts of sea level rise: <ul style="list-style-type: none"> - on the proposed development; and - arising from the proposed development. - whether the proposed development is inconsistent with any coastal zone management plans, floodplain risk management plans and is compatible with the flood hazard of the land. - Whether the proposed development will significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties.
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	<ul style="list-style-type: none"> - Whether the proposed development will significantly adversely affect the environment or cause additional erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses - appropriate measures to manage risk to life from flood. - whether the proposed development is likely to result in unsustainable social and economic costs to the community as a consequence of flooding - implications of flooding over the full range of potential flooding, including the probable maximum flood, should be considered as set out in the NSW Government Floodplain Development Manual. This should include the provision of: <ul style="list-style-type: none"> - Full details of the flood assessment and modelling undertaken in determining any design flood levels (if applicable), including the 1 in 100 year flood levels. - A sensitivity assessment of the potential impacts of an increase in rainfall intensity and runoff (10%, 20% and 30%) and sea level rise on the flood behaviour for the 1 in 100 year design flood if applicable. - site drainage, stormwater quality devices and erosion / sedimentation control measures should be identified and the onsite treatment of stormwater and effluent runoff and predicted stormwater discharge quality from the proposed development should be detailed. - a risk assessment of the likely impacts of climate change on the flooding, stormwater and coastal erosion process. <ul style="list-style-type: none"> • traffic and transport – including: <ul style="list-style-type: none"> - details of road transport routes and access to the site - road traffic predictions for the development during construction and operation - swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site - an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development. • biodiversity – including: <ul style="list-style-type: none"> - accurate predictions of any vegetation clearing on site or for any road upgrades - an assessment of the proposal in accordance with the Biodiversity Assessment Method (BAM) including the potential impacts on any threatened species, populations, endangered ecological communities or their habitats and groundwater dependent ecosystems - the hydrology of the wetland in relation to the ecological and hydrological function of the wetland, including drainage through the wetland, particularly changes to the depth of standing water and any effects on survival of the wetland plants - details of weed management during construction and operation in accordance with existing State, regional or local weed management plans or strategies
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	<ul style="list-style-type: none"> - a description of the measures to avoid, minimise, mitigate and/or offset biodiversity impacts. - consideration of any cumulative impacts. <ul style="list-style-type: none"> • contamination – including: <ul style="list-style-type: none"> - an assessment of the extent and nature of any contamination of the soil, groundwater and marine sediments - conceptual site model detailing the potential risks to human health and the environmental receptors in the vicinity of the site - if required, the preparation of a Remedial Action Plan (RAP) for the site - If a RAP for the site is required, a Part B Site Audit Statement and Report, prepared by an accredited NSW EPA Site Auditor, which details the site can be made suitable for a particular land use if remediated in accordance with the approved RAP. • community and stakeholder engagement – including: <ul style="list-style-type: none"> - a community and stakeholder participation strategy which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted and the form(s) of the consultation, including a justification for this approach - a report on the results of the implementation of the strategy including issues raised by the community and surrounding occupiers and landowners that may be impacted by the proposal - details of how issues raised during community and stakeholder consultation have been addressed and whether they have resulted in changes to the proposal - details of the proposed approach to future community and stakeholder engagement based on the results of the consultation. • visual impacts – including an impact assessment at private receptors and public vantage points. • heritage – including Aboriginal and non-Aboriginal cultural heritage. <ul style="list-style-type: none"> - the EIS must identify and describe the Aboriginal cultural heritage values that exist across the area that will be affected by the development. This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigation in NSW (DECCW 2010), and be guided by the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011). - If after consultation with the local aboriginal land council the identified Aboriginal cultural heritage values are determined to be significant, an Aboriginal Cultural Heritage Assessment Report (ACHAR) must be prepared. - Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR, if required.
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	<ul style="list-style-type: none"> - Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must: <ul style="list-style-type: none"> - demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to Heritage NSW. - include a surface survey undertaken by a qualified archaeologist. The result of the surface survey is to inform the need for targeted test excavation to better assess the integrity, extent, distribution, nature and overall significance of the archaeological record. The results of surface surveys and test excavations are to be documented in the ACHAR. - outline procedures to be followed if Aboriginal objects are found at any stage of the life of the project to formulate appropriate measures to manage unforeseen impacts. - outline procedures to be followed in the event Aboriginal burials or skeletal material is uncovered during construction to formulate appropriate measures to manage the impacts to this material. <p>2. Biodiversity</p> <p>Prepare a Biodiversity Development Assessment Report (BDAR) that assesses biodiversity impacts in accordance with the Biodiversity Conservation Act 2016 and the Biodiversity Assessment Method 2020, unless a waiver is granted, or the site is on biodiversity certified land.</p> <p>If the site is on biodiversity certified land, provide information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification.</p> <p>Any application that is required to be submitted with a Biodiversity Development Assessment Report must use the template available at: https://www.environment.nsw.gov.au/research-and-publications/publications-search/guidance-for-the-biodiversity-development-assessment-report-template.</p> <p>3. Social Impacts</p> <p>Provide a Social Impact Assessment prepared in accordance with the Social Impact Assessment Guideline for State Significant Projects</p> <p>4. Additional Consultation</p> <p>Consideration of consultation between the Proponent and agencies prior to the notification of Secretary's Environmental Assessment Requirements (local SEARs) on 28 July 2023. This must include details of how the issues raised by agencies has been addressed within the EIS.</p> <p>Consideration of consultation undertaken by the Department of Planning and Environment and the responses received from Government agencies, specifically DPI – Fisheries (Attachment 1).</p>
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Plans and Documents	<p>The EIS must include relevant plans, architectural drawings, diagrams and relevant documentation required under Part 8 of the Regulation. Provide these as part of the EIS rather than as separate documents.</p> <p>In addition, the EIS must include the following:</p> <ul style="list-style-type: none"> - high quality files of maps and figures of the subject site and proposal;
Engagement	<p>During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners.</p> <p>In particular you must consult with:</p> <ul style="list-style-type: none"> - Department of Planning and Environment, specifically the: <ul style="list-style-type: none"> - Environment, Energy and Science Group - Water Group - Department of Primary Industries - Environment Protection Authority - National Parks and Wildlife Services - Crown Lands Division - Heritage NSW - Department of Regional NSW, specifically: <ul style="list-style-type: none"> - Department of Primary Industries – Agriculture - Regional NSW Group - Regional Growth & Development Corporation - Local Land Services - NSW Health - NSW Rural Fire Service - SafeWork NSW - Department of Primary Industry - Fisheries - Tweed / Byron Local Aboriginal Land Council - the surrounding landowners and occupiers that are likely to be impacted by the proposal. <p>The EIS must detail the engagement undertaken and demonstrate how it was consistent with the <i>Undertaking Engagement Guidelines for State Significant Projects</i>. The EIS must detail how issues raised and feedback provided have been considered and responded to in the project.</p>
Expiry Date	<p>If you do not lodge an EIS for the infrastructure within 2 years of the issue date of these SEARs, your SEARs will expire. If an extension to these SEARs will be required, please consult with the Planning Secretary 3 months prior to the expiry date.</p>
References	<p>The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. While not exhaustive, the following attachment contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this proposal.</p>

ATTACHMENT 1
Government Authority Responses to Request for Key Issues



Nick Hearfield
Senior Planner, Water Assessments
Department of Planning and Environment
4 Parramatta Square (Locked Bag 5022), Parramatta 2124

Our Ref: OUT23/13179

via email: nick.hearfield@dpie.nsw.gov.au

Dear Mr Hearfield

**Re: Sandhills Wetland Project Cowper Street, Byron Bay (Lot 383 DP 728202) —
Advice pursuant to sections 55 and 56 of the Marine Estate Management Act 2014**

I refer to the above proposal which has recently been drawn to my attention by colleagues in the Department of Primary Industries (DPI) Fisheries. I understand that one of the outcomes of this project will be works relating to or affecting stormwater management in the vicinity of the Cape Byron Marine Park (CBMP), including discharge outfall/s currently located at Main/Clarkes Beach.

Sections 55 and 56 of the *Marine Estate Management Act 2014* (MEM Act) require that determining authorities do not carry out or grant approval to carry out activities that are likely to have an effect on the marine park unless the consent authority has consulted with DPI Fisheries. Marine parks exist to conserve environmental, social, cultural, and economic values, and marine estate legislation extends to all activities that may affect the marine park. Any future works below mean high water, including vehicle or machinery access to undertake the works, will require a marine park permit.

Proponents of works in or adjacent to marine parks are consistently advised that every possible effort must be made to avoid any impact to the values of the marine park including cultural values, wildlife, natural environment, water quality and impacts on other users. Byron Bay and its beaches are an iconic destination with significant values to all stakeholders. Our expectation is that relevant NSW Legislation and Policy guidance is adhered to for proposals within or potentially affecting the CBMP.

The New South Wales Marine Estate Threat and Risk Assessment Final Report 2017 identifies urban stormwater discharge as a priority threat to the environmental assets of the Marine Estate (Table ES 1-2). The proposed works may affect a popular surfing beach and existing stormwater discharge points are close to a Marine Park Sanctuary Zone. My understanding of the intent of the project is that outcomes will include:

- Protecting and enhancing Aboriginal cultural values of the area;
- Showcasing best practice water sensitive urban design;
- Improving water quality including at the stormwater outlet to Clarkes Beach;
- Maximising flood storage to mitigate flooding;
- Ensuring acid sulfate soils (actual and potential) are appropriately accounted for and managed;
- Protecting and enhancing environmental values at the site; and
- Supporting delivery of key actions from the Belongil Creek Floodplain Risk Management Plan (WBM BMT, 2015), Byron Bay Town Centre Masterplan (Macgregor Coxall, 2015) and, the Byron Shire Council and Arakwal Memorandum of Understanding.

Noting these intentions and the environmental risks associated with urban stormwater discharge, the intent of the project is supported. The proponents of new or replacement stormwater infrastructure draining to CBMP are consistently advised that any such infrastructure should include litter traps or similar gross pollutant traps. It is considered that the installation and maintenance of pollutant traps would also meet local community expectations for this popular area.

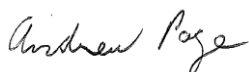
The waters of the marine park must be protected from any impacts associated with any construction works. For example — inputs of foreign materials such as building debris, silt run off, plastic litter, contaminated or potential acid sulphate soils, or other contaminants including those associated with fill material. In addition, any works must be undertaken in accordance with or exceeding the recommendation of “*Managing Urban Stormwater - Soils and Construction Vol 14th Edition March 2004*” Published by the NSW Government (“the Blue Book”) <http://www.environment.nsw.gov.au/stormwater/publications.htm> and, any consent needs to include specific means to provide for this. Potential impacts to the marine park, public access and safety, dune rehabilitation works (if required), and amenity values also need to be considered and provided for.

I note that Byron Shire Council is in the process of preparing a Coastal Management Program (CMP) for the Byron Shire Open Coast. The purpose of this CMP is to define and describe the long-term management strategy for the Byron Bay embayment and beyond. I regard the advice of coastal management experts and engineers from the Department of Planning and Environment (Biodiversity and Conservation Division) as a key source of guidance in the designing of any infrastructure or works that may be necessary in the intertidal area.

I understand that the project will be of considerable interest to the Bundjalung of Byron Bay Aboriginal Corporation RNTBC (Arakwal) and that the locality of the works may be culturally significant. Our expectation is that any proposals for works should not proceed without the endorsement of the Arakwal Aboriginal Corporation.

If you have any queries regarding these comments please do not hesitate to contact me by telephone — 02-6620 9300 or email — cape.byron@dpi.nsw.gov.au.

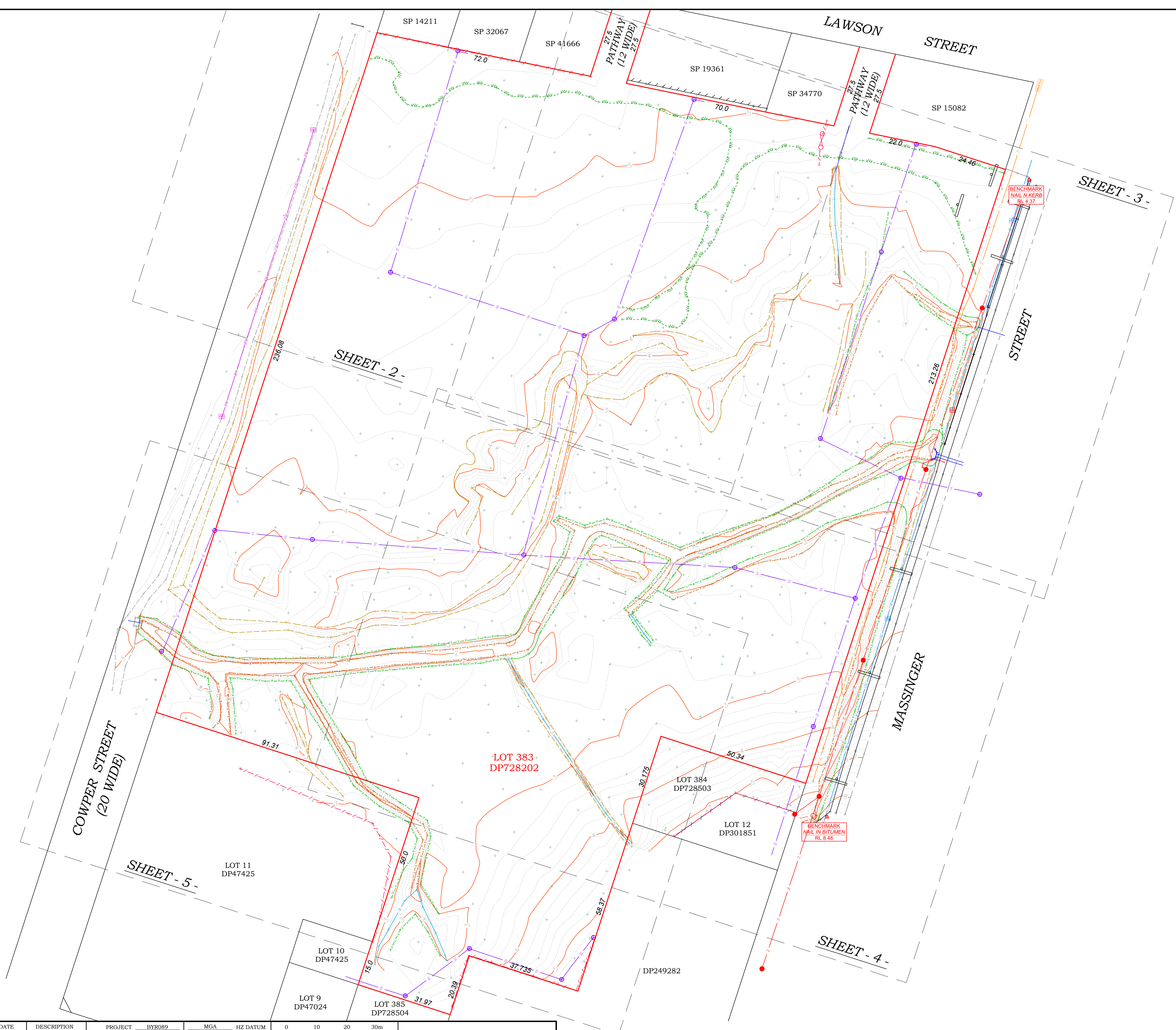
Yours sincerely



Andrew Page
Manager, Cape Byron Marine Park
Delegate — Department of Primary Industries, Fisheries

16 August 2023

Appendix B – Detailed Survey

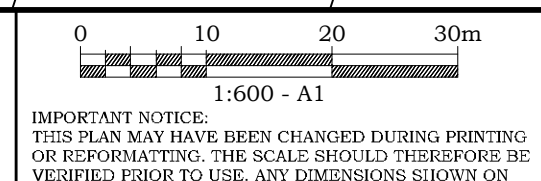


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01	02/08/2021	ORIGINAL ISSUE

PROJECT	BYR089
SURVEYOR	DH
SURVEY DATE	28/07/2021
FIELD BOOK ID	TSC3#2
PLAN BY	DH
APPROVED BY	LF

MGA	HZ DATUM
CORS GNSS	ORIGIN
AHD	VT DATUM
PM41738	ORIGIN
RL 4.535	LEVEL
05/07/2021	SCMS



PLAN OF DETAIL SURVEY	
LOT 383 IN DP728202 SANDHILLS WETLAND BYRON BAY NSW	CLIENT: PLANT DWG No: BYR089.DS.DWG SH: 1 OF 5

BOUNDARIES HAVE BEEN INVESTIGATED (NOT MARKED) IN ACCORDANCE WITH THE PROVISIONS OF THE SURVEYING & SPATIAL INFORMATION ACT, 2017 AND ARE BASED ON THE LATEST SURVEY RECORDS AVAILABLE FROM LAND REGISTRY AT THE TIME OF SURVEY. NO RESPONSIBILITY CAN BE TAKEN FOR SURVEYS AT A LATER DATE WHICH MAY VARY BOUNDARY DIMENSIONS. ANY EASEMENTS WHETHER REGISTERED OR IMPLIED HAVE NOT BEEN INVESTIGATED. THE POSITIONAL ACCURACY OF ANY CRITICAL FEATURE REQUIRES CONFIRMATION PRIOR TO ITS USE IN DESIGN OR CONSTRUCTION. UNDERGROUND SERVICES HAVE NOT BEEN INVESTIGATED. CONSULT WITH "DIAL BEFORE YOU DIG" PRIOR TO ANY EXCAVATION WORKS.

DISCLAIMER

LEGEND

MAJOR CONTOUR 1.0m

MINOR CONTOUR 0.2m

SUBJECT BOUNDARY

ADJACENT BOUNDARY

BANK BOTTOM

BANK CHANGE GRADE

BANK TOP

CONCRETE

CENTRE LINE

DRAIN

EDGE OF BITUMEN

FENCE

HEAD WALL

POWER LINE

ROAD KERB BACK

ROAD KERB INVERT

ROAD KERB LIP

ROAD KERB TOP

TRACK

UNDERGROUND COMMUNICATIONS

UNDERGROUND ELECTRICAL

UNDERGROUND SEWER PIPE

UNDERGROUND STORM WATER

UNDERGROUND WATER

UNDERGROUND RECYCLED WATER

VEGETATION LINE

ELECTRICAL POLE

ELECTRICAL POLE STAY WIRE/POST

FIRE HYDRANT

TELSTRA PIT

SEWER MANHOLE

SIGNAGE

WATER STOP VALVE

NATURAL SURFACE LEVEL

TREE DETAILS

DENOTES A TREE WITH TRUNK DIAMETER <100MM
APPROX. QUANTITY - 135

DENOTES A TREE WITH TRUNK DIAMETER 100-200MM
APPROX. QUANTITY - 975

DENOTES A TREE WITH TRUNK DIAMETER 200-300MM
APPROX. QUANTITY - 850

DENOTES A TREE WITH TRUNK DIAMETER >300MM
APPROX. QUANTITY - 360

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0 5 10m

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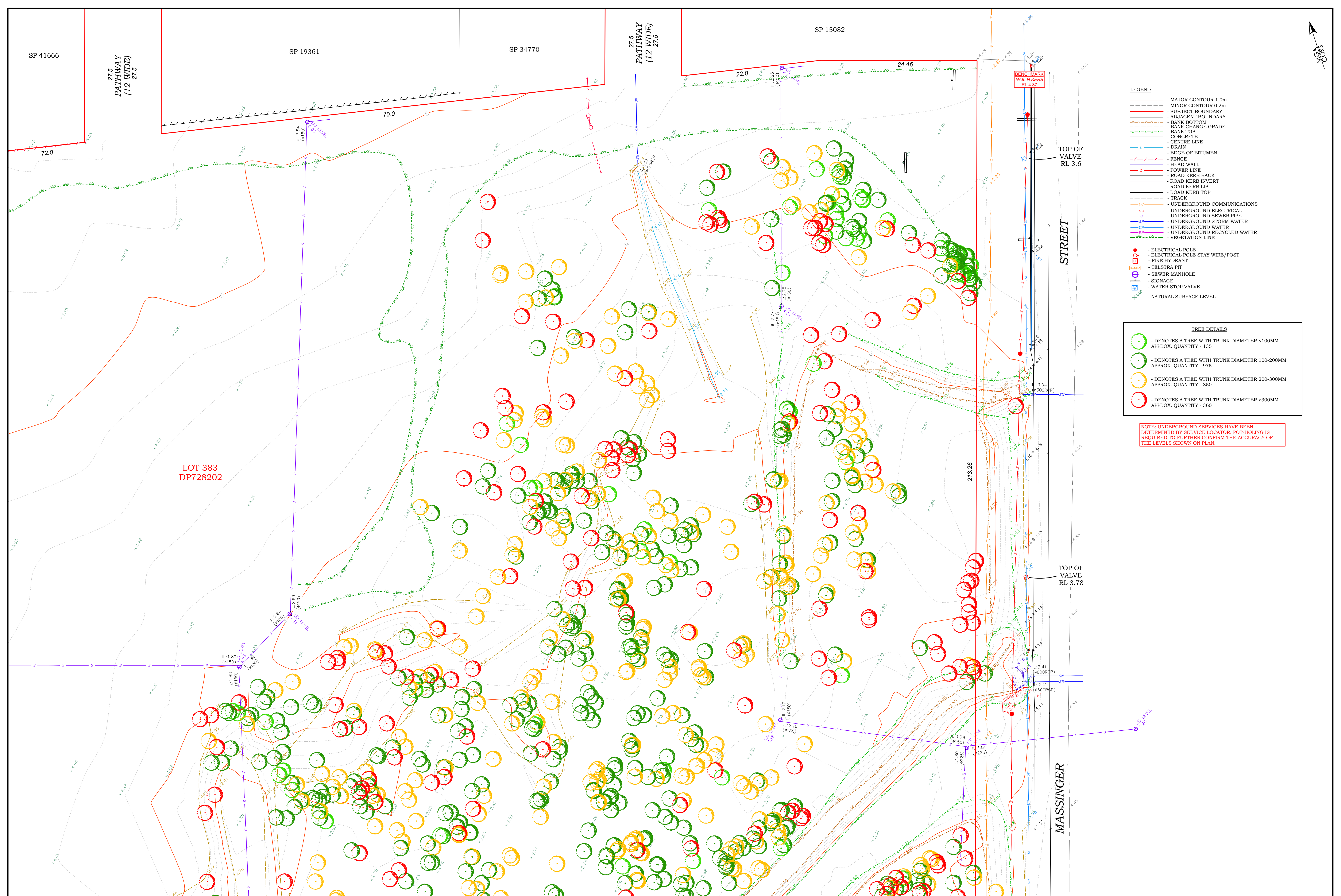
PLAN OF DETAIL SURVEY

LOT 383 IN DP728202
SANDHILLS WETLAND
BYRON BAY NSW

CLIENT: PLANT
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SH: 2 OF 5

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PLAN OF DETAIL SURVEY
LOT 383 IN DP728202 CLIENT: PLANT
SANDHILLS WETLAND DWG No: BYR089 DS.DWG
BYRON BAY NSW SH: 3 OF 5

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LEGEND

- MAJOR CONTOUR 1.0m
- MINOR CONTOUR 0.2m
- SUBJECT BOUNDARY
- ADJACENT BOUNDARY
- BANK BOTTOM
- BANK CHANGE GRADE
- BANK TOP
- CONCRETE
- CENTRE LINE
- DRAIN
- EDGE OF BITUMEN
- FENCE
- HEAD WALL
- POWER LINE
- ROAD KERB BACK
- ROAD KERB INVERT
- ROAD KERB LIP
- ROAD KERB TOP
- TRACK
- UNDERGROUND COMMUNICATIONS
- UNDERGROUND ELECTRICAL
- UNDERGROUND SEWER PIPE
- UNDERGROUND STORM WATER
- UNDERGROUND WATER
- UNDERGROUND RECYCLED WATER
- VEGETATION LINE
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TOP OF VALVE
RL 4.15

STREET

MASSINGER

BENCHMARK
NAIL IN BITUMEN
RL 8.48

LOT 384
DP728503

LOT 12
DP301851

LOT 383
DP728202

LOT 11
DP47425

PLAN OF DETAIL SURVEY

LOT 383 IN DP728202
SANDHILLS WETLAND
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CLIENT: PLANT
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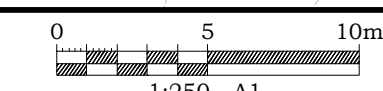
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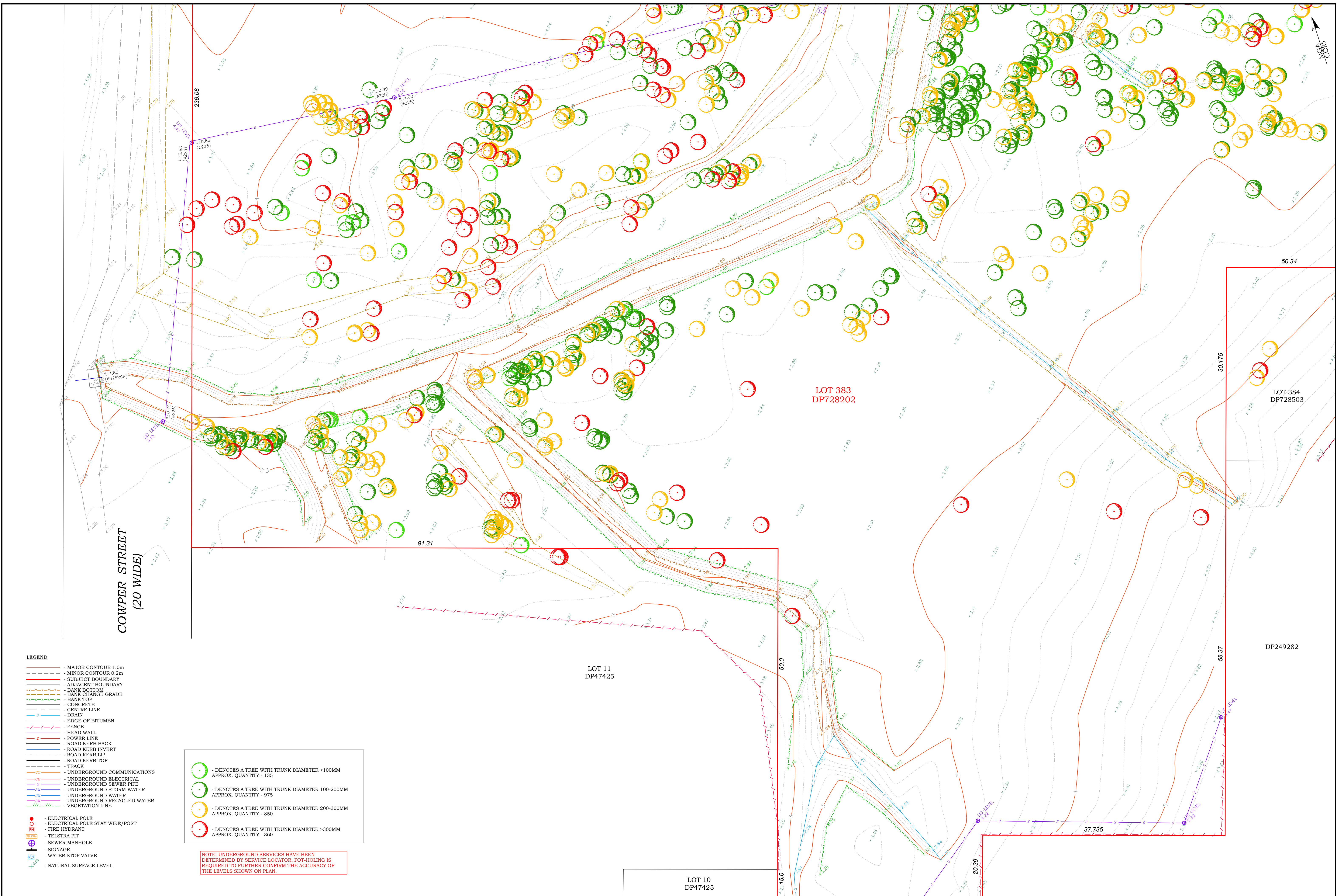
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