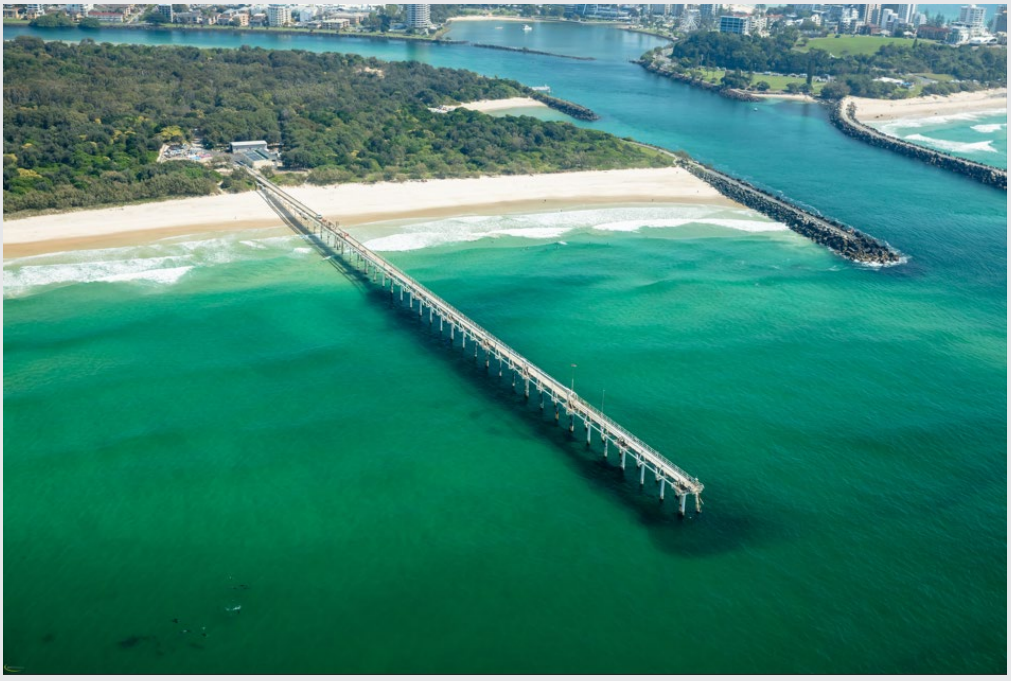
Tweed Sand Bypassing

Environmental Monitoring Report

May 2023 to April 2024



Project: Tweed River Entrance Sand Bypassing Project

Report No. CA – 25

January 2025

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Term/Acronym/Department	Definition
AC	TRESBP Advisory Committee
ACC	TRESBP Advisory Committee & Community (no longer active)
AHD	Australian Height Datum
AMG	Australian Mapping Grid
CoGC	City of Gold Coast
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CA	Concession Agreement for the operation of the TRESBP
DA	Development of Agreement for the construction of the TRESBP
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPHI	Department of Planning, Housing and Infrastructure
DPIE	New South Wales Department of Planning, Industry and Environment (including Environment, Energy and Assessment, Planning and Assessment and Housing and Property)
DSITIA	Queensland Department of Science, Information, Technology, Innovation and Arts
DETSI	Queensland Department of Environment, Tourism, Science and Innovation
DUAP	New South Wales Department of Urban Affairs and Planning (now DPIE – Environment, Energy and Science)
EIS/IAS	Environmental Impact Statement / Impact Assessment Study
EMP	Environmental Management Plan
EMS	Environmental Management System
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
CoGC	City of Gold Coast
Governments	News South Wales Minister for Transport and Roads & Minster for Regional Transport and Roads and the Queensland Minister for the Environment and the Great Barrier Reef, Minister for Science and Minister for Multicultural Affairs
ISG	Integrated Survey Grid
Joint Proponents	News South Wales Minister for Transport and Roads & Minster for Regional Transport and Roads and the Queensland Minister for the Environment and the Great Barrier Reef, Minister for Science and Minister for Multicultural Affairs
MUAP	New South Wales Minister for Urban Affairs and Planning (now the Minister for Planning and Public Spaces)

NSW	New South Wales
NSW DPIRD (Fisheries and Forestry	NSW Department of Primary Industries and Regional Development
NSW EPA	New South Wales Environmental Protection Authority
NSW NPWS	New South Wales National Parks & Wildlife Service
Qld	Queensland
Qld DPI	Queensland Department of Primary Industries
TBLALC	Tweed Byron Local Aboriginal Land Council
TfNSW	Transport for NSW
TRESBCo	Tweed River Entrance Sand Bypassing Company
TRESBP	Tweed River Entrance Sand Bypassing Project
TSB	Tweed Sand Bypassing
TSC	Tweed Shire Council
WG	TRESBP Working Group

ENVIRONMENTAL MONITORING REPORT
May 2023 to April 2024

Table 1 – Review of Environmental Management Operations

Name of operation	Tweed River Entrance Sand Bypass Project
Name of operator	TRESBCo
Development consent / project approval #	D94/00236
Name of holder of development consent / project approval	Tweed River Entrance Sand Bypassing
Mining lease #	N/A. TRESBP is not a mining operation.
Name of holder of mining lease	N/A
Water licence #	N/A
Name of holder of water licence	N/A
MOP/RMP start date	*Rehabilitation works were completed in the vicinity of the Jetty previously by TRESBCo soon after operations started in 2001. Due to operations being carried out in the natural environment affected by storm activities, rehabilitation works will be ongoing and on needs for basis.*
MOP/RMP end date	See above
Annual Review start date	1 May 2023
Annual Review end date	30 April 2024

I, Matthew Harry, certify that this audit report is a true and accurate record of the compliance status of TRESBP for the period May 2023 to April 2024 and that I am authorised to make this statement on behalf of TRESBP.

Note.

a) *The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false ormisleading information (or provide information for inclusion) in an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.*

b) *The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).*

Name of authorised reporting officer	Matthew Harry
Title of authorised reporting officer	Project Manager for NSW and Qld Governments - Tweed Sand Bypassing
Signature of authorised reporting officer	
Date	17 January 2025

1 Statement of compliance

Development Consent (DC) was granted for the project by the relevant authorities at the start of the contract in 1999. The development was completed and was ready for the start of operations in May 2001. Both the Governments (currently Transport for New South Wales – TfNSW and Queensland Department of Environment, Tourism, Science and Innovation – DETSI) and the operator (Tweed River Entrance Sand Bypassing Company – TRESBCo) have carried out environmental monitoring to comply with the relevant approval conditions and results are presented in the report below.

The Tweed River Entrance Sand bypassing Project (TRESBP) now referred to as the Tweed Sand Bypassing (TSB) is not a mining operation. Sand is transported by mechanical means from the active beach zone and then placed back along the beach in the active beach zone to mimic natural sediment transport. No sand is mined.

Table 2 Statement of compliance

Were all conditions of the relevant approval(s) complied with?	
Development Consent	No A non-compliance was identified for failure to provide updates to the EMP and timely response to Department directives. TSB has been in consultation with the Department since this non-compliance was raised. Refer section 2.5 Compliance Summary for further details.
Mining License	N/A

2 Executive Summary

2.1 Requirement

The purpose of this report is to assess the environmental performance of the Tweed Sand Bypass operations for the reporting period against the Ministers Conditions of Approval (MCoA), which includes the Environmental Impact Statement and Representations Report.

This report documents the project's environmental management and monitoring outcomes for the period from May 2023 to April 2024.

2.2 Environmental reporting obligations

MCoA 15 (application no. G94/00236) under the EP&A Act for the TRESBP states:

> The proponent shall submit three (3) monthly reports to the Director-General and the EPA on the results of monitoring commencing after the date of actual commencement of construction works at the site until the completion of construction and six (6) monthly during bypass operation for the first two years and annually after that or at any other period as determined by the Director-General. The reports shall include, but not be limited to, information on the following:
>
> i) Any applications for consents, licences and approvals, and responses from relevant authorities during the reporting period;
>
> ii) Implementation and effectiveness of environmental controls and conditions relating to work undertaken;
>
> iii) Identification of impact predictions made in the EIS and other supplementary studies and details of the extent to which the actual impacts reflect the predictions;
>
> iv) Details and analysis of environmental monitoring;
>
> v) Assessment of compliance with Environmental management Plan(s) for both construction and operation activities;
>
> vi) Number and details of any complaints, including a summary of the main areas
>
> vii) Number and details of any complaints, including a summary of the main areas
>
> Copies of these reports shall be submitted at the same time to the Director-General EPA, NSW Fisheries, NPWS and the Advisory Committee and be made available to the public on request.

The provision of this report to the EPA, NSW DPIRD (Fisheries and Forestry), NPWS and the Advisory Committee is distributed for information purposes only. While TSB welcomes feedback from our stakeholders, it is not a requirement to provide a response to this annual report.

2.3 Tweed Sand Bypassing Project Context

Appendix G outlines the detailed history and description of the project including the statutory and other obligations relevant to environmental management. It is recommended that readers not familiar with TSB operations and its governance arrangements familiarise themselves with Appendix G before reading this report.

2.3.1 Provision of Data and Information

TSB shares a significant amount of operational data on the Tweed Sand Bypass website. This website enables clear tracking and transparency of information to stakeholders and the community and promotes accountability amongst the team to undertake consistent and proactive analysis of data.

Appendices and provision of hard copy supporting information for this report have been mindfully reduced and linked to the website where both appropriate and applicable.

TSB maintain all records in accordance with our records management procedure and can provide copies of any of the information referenced upon request.

All supporting information referenced in this report can be downloaded from the website.

Tweed Sand Bypassing - Website - Tweed Sand Bypass (nsw.gov.au)

Links have been provided throughout this section to assist with navigation to the relevant parts of the website.

2.4 2023-2024 Operations Summary

Key activities of note throughout the 2023-2024 monitoring period are listed below:

Total Volume of sand delivered by the JMPS	409,635 m^3
Total volume of sand dredged from the entrance	259,527 m^3
Maintenance dredging dates	May 2023 to Oct 2023
Volume of sand delivered to Bilinga in a placement trial monitored by Qld government to achieve co-benefits in surf amenity	80,000 m^3
Environmental incident relating to a hydraulic fluid spill reported to relevant authorities. Refer section 3.4.	26 May 2023

2.5 Compliance Summary

2.5.1 Ministers Conditions of Approval

The MCoA's were mostly satisfied during the reporting period, with the exception of:

- Condition 1, 3 and 12 due to failure to provide updates to the EMP and timely response to the Department. Tweed Sand Bypassing has been working with stakeholders and the Department to undertake a complete review of the EMP-Operations and sub-plans for Department approval in line with changes to the operating model and cessation of the concession agreement with TRESBCo. This process commenced during the monitoring period. Approval of the new EMP-Operations and supporting plans was granted September 2024. TSB has also provided a response to the Department in relation to non-compliances outlined in section 7.1 Independent Audit, which are also associated with the conditions above.

A full evaluation of compliance against the MCoA's is detailed in Appendix D for the reporting period.

2.5.2 Environmental Management Plan

Implementation of and compliance with each sub-plan of the EMP-Operations has been assessed for this reporting period. TSB Operations have generally been undertaken in accordance with the latest approved versions.

Note that the environmental management framework for operations has sub-plans that are managed by both the Governments and TRESBCo, further detail can be found in Project Background Appendix G.

A summary of compliance against sub-plans managed by Governments is provided in Table 3.

Table 3 Summary of compliance against Governments sub-plans

Sub-Plan	Compliant	Comments
B1 Consultation Strategy Plan	Y	
B9 Letitia Spit Avifauna Habitat Management Plan	Y	
B13 Beach Management and Nourishment Strategy	Y	
B14 Kirra Reef Management Plan	Y	
B15 Duranbah Surf Quality & Beach Amenity Management Plan	Y	
B16 Tweed River Entrance & Lower Estuary Management Plan	Y	

A full evaluation of compliance against the EMP and sub-plans is detailed in Appendix E Governments sub-plans and Appendix F TRESBCo sub-plans.

2.5.3 EIS/IAS impact predictions

No operational changes have occurred within the reporting period that have had the potential to change previous assessments in relation to EIS/IAS predictions.

The Independent Environmental Audit (IEA) provided a comprehensive assessment against EIS/IAS predictions and did not identify any inconsistencies caused by TSB operations.

Recommendation two (RE2) from the IEA conducted by L2R Advisory stated:

"With the EIS predictions made in 1998, with multiple reviews of EIS predictions being undertaken, including thorough specialist reports, within the projects 24 years of operation, with no significant negative findings, it is the view of the auditor that the value to the government, project, community and environment of assessing the EIS impact predictions every 5 years (for perpetuality) is limited and diminishes with each assessment."

TSB is investigating an approval modification (as per RE2) that removes the obligation to assess compliance against EIS/IAS impacts in perpetuity.

2.6 Applications for approvals during the monitoring period

There were no new applications for approvals made during this monitoring period.

2.7 Acknowledgements

This document has been prepared jointly by the following parties on behalf of the Tweed River Entrance Sand Bypassing Project's joint proponents being, the NSW Minister for Transport and Roads and Minister for Regional Transport and Roads and the Queensland Minister for the Environment and the Great Barrier Reef, Minister for Science and Minister for Multicultural Affairs:

- Transport for NSW
- Queensland Department of Environment, Tourism, Science and Innovation
- Tweed River Entrance Sand Bypassing Company

For further information regarding the Tweed River Entrance Sand Bypassing Project, please refer to the following websites:

www.tweedsandbypass.nsw.gov.au
https://www.qld.gov.au/environment/coasts-waterways/beach/restoration/tweed-river
http://ci.wrl.unsw.edu.au/current-projects/tweed-river-sand-bypassing-project/

Queries concerning this report or monitoring outcomes may be directed to the Governments' Project Manager:

TRESBP Project Manager
Transport for NSW
14 Eden Street
Tweed Heads NSW 2485

Phone: 0437 273 874

Email: matthew.harry@transport.nsw.gov.au

3 Operations summary

Tweed Sand Bypassing - Operations (nsw.gov.au)

3.1 Mining operations

N/A

3.2 Sand Delivery

Tweed Sand Bypassing - Sand delivery (nsw.gov.au).

The project's Stage 1 and Stage 2 works have collected approximately **17.82 Million m³** of sand from the Tweed River bar/ entrance area and area connecting the Jetty system from **April 1995 to April 2024**.

- Stage 1 works (1995 to 1998) = 3.04 Million m^3 of sand
- Stage 2 works (to end April 2024) = 14.77 Million m^3 of sand

The volume of sand on the southern Gold Coast beaches (i.e. Snapper Rocks East to North Kirra) has increased as a result of sand nourishment by the project.

This sand initially accreted within the southern Gold Coast area and is now dispersing northwards along the coastline.

3.2.1 Sand bypassed by the system

TSB was operated successfully without significant interruption during the reporting period. The following provides a summary of operations:

Days operated during year	224 days
Average days operated per month	18.7 days
Average hours operated per day	5.7 hours
Maximum volume pumped per day	9,421.2 m^3 (12 Sep 2023)
Average pumping rate per day	1,828.7 m^3/day
Total volume for monitoring period	409,635 m^3

Sand was delivered by TRESBCo, in accordance with the sand delivery program developed by the project Working Group (which includes representatives of the Governments, City of Gold Coast and Tweed Shire Council), in consultation with the project's community-based Advisory Committee.

Sand was predominantly pumped to Snapper Rocks east discharge point consistent with previous years. No nourishment campaigns were completed at Duranbah beach during the reporting period, however one (1) was completed in May 2024 at the commencement of the next reporting period.

Sand pumping volumes are presented in Table 4.

Table 4 Monthly Sand Delivery Volumes (JMPS) May 2023 to April 2024

Month	Duranbah	SR-E	Kirra	Greenmount	SR-W	TOTAL
May	0	35,478	0	0	0	35,478
June	0	23,324	0	0	0	23,324
July	0	32,493	0	0	0	32,493
August	0	22,418	0	0	0	22,418
September	0	44,687	0	0	0	44,687
October	0	39,147	0	0	0	39,147
November	0	37,414	0	0	0	37,414
December	0	14,328	0	0	0	14,328
January	0	29,653	0	0	0	29,653
February	0	38,262	0	0	0	38,262
March	0	49,535	0	0	0	49,535
April	0	42,896	0	0	0	42,896
TOTAL	0	409,635	0	0	0	**409,635**

3.2.2 Sand delivered by dredge

Dredging was undertaken from May to October of 2023. A total of 259,527 cubic metres of sand was dredged from the entrance and delivered by dredge to several approved placement areas as outlined in the table below.

Approved placement areas can be viewed at the following link Tweed Sand Bypassing - Dredging (nsw.gov.au).

Table 5 Annual Sand Delivery Volumes (Dredge) May 2023 to April 2024

Location	TOTAL
Bilinga	80,728
Snapper Rocks East	68,680
Duranbah	68,060
Fingal (back-passing)	31,084
Dreamtime (back-passing)	10,975
TOTAL	**259,527**

3.2.3 Sand delivery forecast for next reporting period

The forecast for the operation that an average of 500,000m^3 of sand will be assisted by mechanical means to designated areas of the active beach zone for the May 2024 to April 2025 reporting period.

3.3 Operational Works

There were no changes to operations during the reporting period.

3.3.1 Rehabilitation

Rehabilitation works were completed in the vicinity of the Jetty previously by TRESBCo, soon after operations started in 2001. Due to the operation being carried out in the natural environment and affected by storm activity, rehabilitation works will be ongoing and on needs for basis.

3.3.2 Water

N/A

3.4 Environmental Incidents

A dredge environmental incident was reported to AMSA, NSW EPA and QEPA on the 26 May 23, in relation to a bio-degradable hydraulic fluid leak from ram <50l. Refer Appendix H for Environmental Incident Reports.

4 Environmental Monitoring

This section describes the key monitoring activities undertaken as part of the environmental monitoring program for Tweed Sand Bypassing. Results of the program and discussion on environmental performance is included in Section 5.

4.1 Monitoring program

Table 6 provides a summary of key environmental monitoring activities undertaken during the reporting period.

Table 6 Summary environmental monitoring activities May 2023 to April 2024

Monitoring		Frequency	Timing
Wave conditions & Sediment transport	Wave buoy data analysis and LITPACK modelling	Monthly	May 2023 - Apr 2024
Tidal Analysis	Letitia 2A Tide Gauge harmonic tidal analysis	Annually	Post monitoring period
Survey	Pre-dredge & Post Dredge	As required	**Pre** May & Aug 2023 **Post** Jun & Oct 2023
	Tweed River Entrance	Quarterly + additional as required (AES)	Jul & Oct 2023 Jan & Apr 2024 **AES** Jun 2023, Feb 2024
	Full Coastal (including entrance)	Twice per year	May & Nov 2023
	Duranbah Upper Beach	As required	Feb 2024
	Control Volume	Quarterly	Jul & Nov 2023 Jan & Apr 2024
	Tweed River (CSIRO)	Annually	Aug 2023
	Kirra Reef	Annually	May 2023
Beach Conditions	Coastal imaging network – beach width analysis	Monthly	May 2023 - Apr 2024
	Aerial photography (vertical and obliques)	Quarterly	Aug & Oct 2023 Feb & Apr 2024
	Survey (as above)		
	Beach photos	Monthly	May 2023 - Apr 2024
Reef Monitoring	Kirra (Reef) – biota field survey	Annually	Jul 2024
	Cook Island (Reef) – biota field survey	Annually	Jul 2024
	Cook Island (seagrass)	Annually	Nov 2023
	Observations – aerial photography (as above)		
Tweed River Lower Estuary Shoals and Wetlands Extents	Aerial and survey observations and analysis	As required	Not triggered
Entrance Vessel Usage	Marine Rescue NSW - vessel counts	Daily	May 2023 - Apr 2024

4.2 Wave Buoys

Queensland Government (DETSI) maintain a network of wave monitoring sites to measure the height and direction of waves along the Queensland coast which extends into NSW waters.

An annual wave climate summary report is produced for the project. Versions of this report, including the latest version, are available on the TSB website.

Tweed Sand Bypassing - Coastal conditions

All wave condition data is also now available to be accessed online through the Queensland government website.

http://www.qld.gov.au/waves

DETSI operates two wave buoys jointly with the TSB:

- 'Tweed Heads' nearshore buoy (installed Jan 1995) located in approximately 22m water depth off Letitia/ Fingal beaches; and
- 'Tweed offshore' buoy (installed Jan 2020) in approximately 60m water depth to the east and adjacent to Kingscliff and Dreamtime beaches.

4.3 Sediment Transport

Sand flows northwards along the northern NSW coast at a rate estimated to be in the order of 500,000 m^3 per year under waves predominantly from the SE. This is due to natural coastal processes, with the net effect of these processes referred to as Longshore Sediment Transport (LST). The amount of LST is estimated to vary from 250,000 m^3 to 1,000,000 m^3 each year depending on the wave conditions.

TSB uses a one-dimensional sediment transport program (Litpack model) to calculate sediment transport rates under defined hydrodynamic conditions. Monthly wave data is a key input enabling 'natural' transport rates for sand that travels north along Letitia Beach to be estimated.

Understanding sediment transport rates is important to achieving the legislative project objective (set out under enabling Acts) of continuing supply of sand to the southern Gold Coast beaches at a rate consistent with LST rates of these beaches.

4.4 Tidal Monitoring

The EIS predicted that water levels would increase in the Tweed River estuary as a result of the initial dredging of the Tweed River entrance and/or with the reduction in lower estuary shoals due to TSB operations or from scour following major flood events.

NSW Manly Hydraulics Laboratory (MHL) operate continuous recording stations at three locations of interest to the Tweed Sand Bypassing: Letitia 2A at the Tweed River entrance, Coffs Harbour Jetty, and Mooloolaba at the Sunshine Coast.

Data collected from these stations is used to undertake tidal harmonic analysis to inform whether morphological changes within the Tweed River Entrance has had an impact on astronomical tidal response.

This analysis has been undertaken annually at the Letitia 2A (Tweed River) tide gauge for the duration of the TSB operations to date.

Raw data is available on MHL website https://www.mhl.nsw.gov.au/Station-201429.

4.5 Survey

Regular sand monitoring surveys of the Tweed River entrance and beach profiles from Dreamtime Beach in NSW to Currumbin Beach in Qld was undertaken during the reporting period. The surveys comprise of a land-based component (beach profiles) and/ or a hydrographic surveying component.

The extent of survey works covers the following area at different times during the reporting period:

- The coastal area from Dreamtime Beach in NSW to Currumbin Beach in Qld, Kirra Reef and the Tweed River entrance. This area includes the upper beach and the seabed in the nearshore area i.e. from RL +4 mAHD to -20 mAHD.

4.6 Tweed River Entrance

The Tweed River Entrance is actively monitored through hydrographic survey as the depth of the entrance is a key parameter when assessing against legislative objectives. Entrance volume is also monitored to track infill rates post dredging and inform future dredge designs.

Other monitoring activities undertaken that assist in entrance management include Tidal Monitoring, aerial imagery and monitoring of entrance vessel usage.

4.6.1 Training wall stability

The training walls at the Tweed River Entrance are assessed and managed by Maritime Infrastructure Delivery Office (MIDO) of TfNSW. They are not a TSB asset that is managed or assessed as part of the project.

TSB have dredge limits in both depth and extent that protect the toe of the training wall from operations. Tidal monitoring is also undertaken at the Letitia 2A gauge to monitor any significant changes to astronomical tidal response from morphological changes to the entrance.

4.7 Reef monitoring

The EIS/ IAS predicted a reduction in extent of the Kirra Reef because of the project, and conditions of approval imposed an exclusion zone to manage and reduce potential impacts to the reef.

Three distinct reef areas were identified in 1995 *(maximum extent recorded in 1995),* a shallow southern reef, a shallow eastern reef near the current groyne, and a northern section of reef section in deeper water. In recent years, only the northern section located in deeper waters has been uncovered. Reef areas in shallow waters (southern and eastern sections) have a low profile (or relief) and are likely to be more prone to natural disturbance from sand coverage and/ or wave turbulence in comparison to reef areas in deeper waters. The higher frequency of physical disturbance in these shallower sections of the reef is likely to limit the development of a diverse community of reef dwelling organisms on these reef sections.

Six reef locations are included in surveyed activities (refer Figure 1): Kirra Reef (previously impacted reef, as assessed under the EIS/ IAS); Cook Island West and South Reefs (potential impact reefs, as assessed under an REF for back-passing by dredge); and Cook Island North Reef, Palm Beach Bait Reef, and Palm Beach Reef (comparative reefs). Historically monitoring has occurred in May to June, however it was recommended to move this date forward to July in favour of expected

environmental conditions. With additional seagrass monitoring occurring at Cook Island in November.

Figure 1 Reef monitoring locations (Ecological Service Professionals Pty Ltd)

4.8 Imagery and Observations

4.8.1 Coastal Imaging Network

A network of 16 coastal imaging cameras is used to monitor the beaches of the stretch of coast extending from North Kirra in Queensland to Duranbah in New South Wales, as well as the Tweed River entrance. Four cameras are mounted at four site locations, to capture the full extent at each site.

Images from the cameras are collected every 15 minutes and processed to produce still images or timelapse sequences. The width of the beach is also mapped weekly, providing data for the evolving condition of the beaches and the impacts of severe weather events. Images and data from the coastal imaging stations has been collected by Water Research Laboratory – UNSW (WRL) on behalf of the project for over a decade.

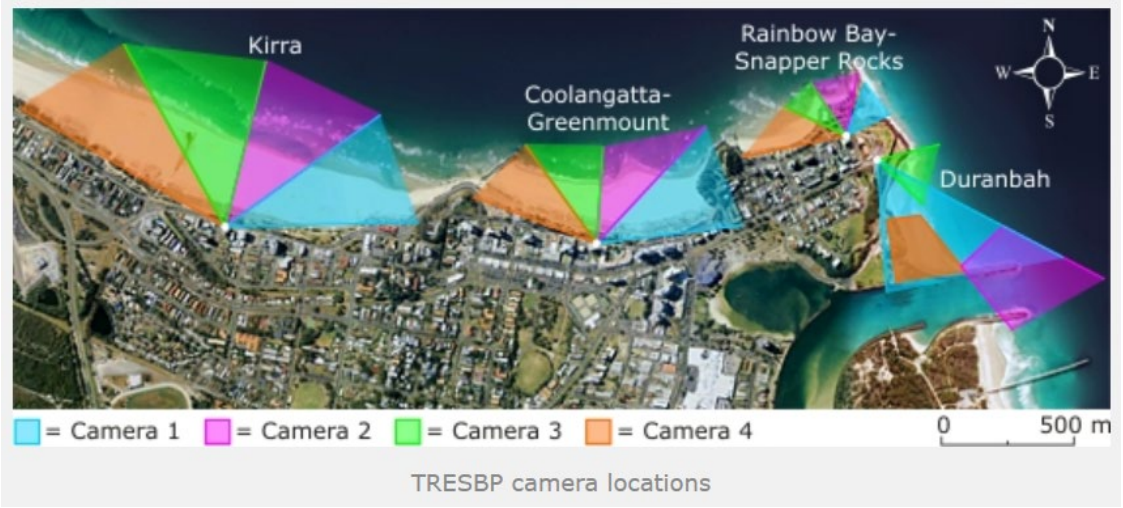


Figure 2 Argus camera locations (Water Research Laboratory - UNSW)

4.8.2 Aerial Photography

Aerial oblique photography is captured quarterly at specific locations from Fingal to Currumbin. Oblique imagery provides a visual representation for correlation against survey data and beach width data.

4.8.3 Beach photos and observations

Observations may be used at times to inform stakeholders in monthly environmental summaries.

TSB staff routinely take landscape pictures of beaches from key locations across the project area. These are replicated monthly to reveal beach profile changes.

Various local media sources also provide anecdotal condition reports and images of surf amenity.

4.9 Monitoring by other agencies

4.9.1.1 Bathymetric Survey

As part of the Northern Rivers Resilience Initiative, the CSIRO completed LiDAR survey of the Northern Rivers region, which included the Tweed River. The dataset was completed during the reporting period and made available to the public in June 2024 through the Geoscience Australia Elvis website.

4.9.1.2 NSW DPIRD (Fisheries and Forestry)

NSW Estuarine Mapping (shinyapps.io).

The NSW DPIRD (Fisheries and Forestry) has developed an interactive mapping tool that consolidates historic and current estuarine habitat data sets into a single point of reference. The estuarine habitat includes seagrass, mangrove and saltmarsh across a variety of species. The Tweed River has been mapped with 1983, 2003 and 2022 data sets.

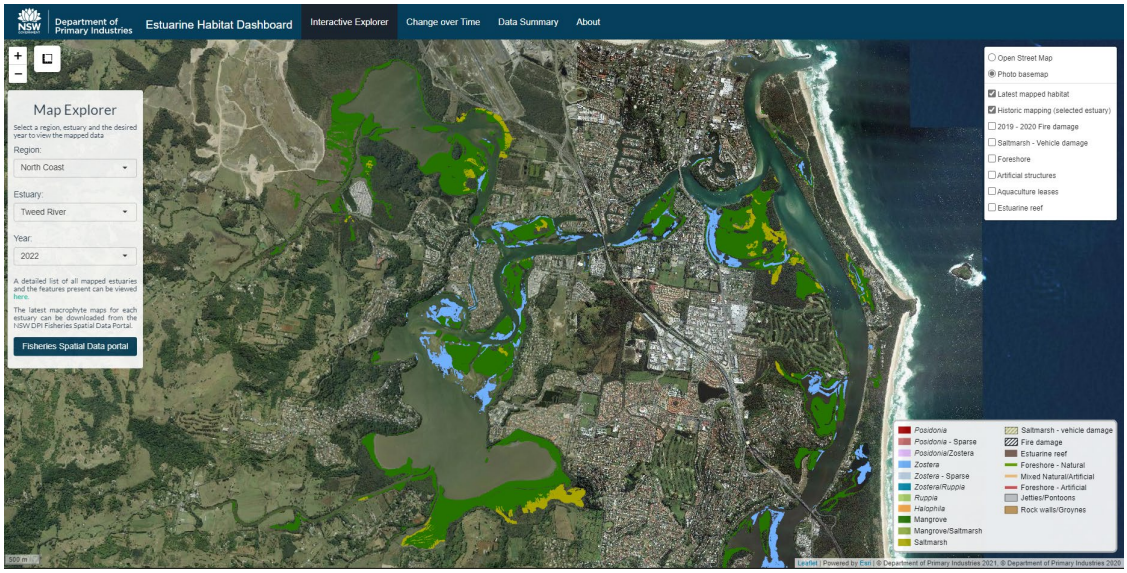


Figure 3 Tweed River Estuarine Habitat Distribution 2022 **(Department of Primary Industries, 2023)**

4.9.1.3 Tweed Shire Council

Tweed River Estuary: Coastal Management Program 2022 - 2032 (nsw.gov.au)

The Coastal Management Program (CMP) recognises the achievements of past management plans and programs, primarily the Lower Tweed River Management Plan (PWD, 1991) and the Upper Tweed Estuary Management Plan (TRMPAC, 1996), however addresses the requirements of the State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP) and supports the implementation of the management objectives of the Coastal Management Act, 2016 (CM Act) (Hydrosphere Consulting, 2022).

The CMP includes a suite of coastal planning and management actions that aim to protect and conserve estuarine and terrestrial ecosystems for the enjoyment of all stakeholders whilst optimising the value of the floodplain and waterways for existing agricultural, commercial, recreational and cultural users, to protect and enhance natural coastal processes and to improve the resilience of coastal assets (Hydrosphere Consulting, 2022).

A key component of the CMP is an estuary health monitoring and reporting program. It was noted that estuary health is currently monitored through a series of disconnected monitoring programs at a variety of timescales and is rarely reported in a holistic and comprehensible manner. The aim of the estuary health monitoring and reporting program is to consolidate monitoring activities into a structured program that is consistent (Hydrosphere Consulting, 2022). This program is an initiative of Tweed Shire Council.

Tweed Sand Bypassing is a stakeholder and consulted for the provision of survey data to assist with program requirements.

5 Environmental Performance

The results of environmental and project performance are predominately distributed through the Tweed Sand Bypass website. The website enables clear tracking and transparency of information to stakeholders and the community and promotes accountability amongst the team to undertake consistent and proactive analysis of data.

The appendices and provision of supporting information for this report have been mindfully reduced and linked to the website where both appropriate and applicable.

Tweed Sand Bypassing - Website - Tweed Sand Bypass (nsw.gov.au)

Tweed Sand Bypassing - Environment Monitoring (nsw.gov.au)

Links have been provided throughout this section to assist with navigation to the relevant parts of the website.

Note: TSB maintain all records in accordance with our records management procedure and can provide copies of any of the information referenced upon request.

5.1 Wave Analysis

Below provides a summary of the wave data collected from these two wave buoys for the reporting period, with the nearshore buoy showing only 2 periods where H_{sig} was >3m.

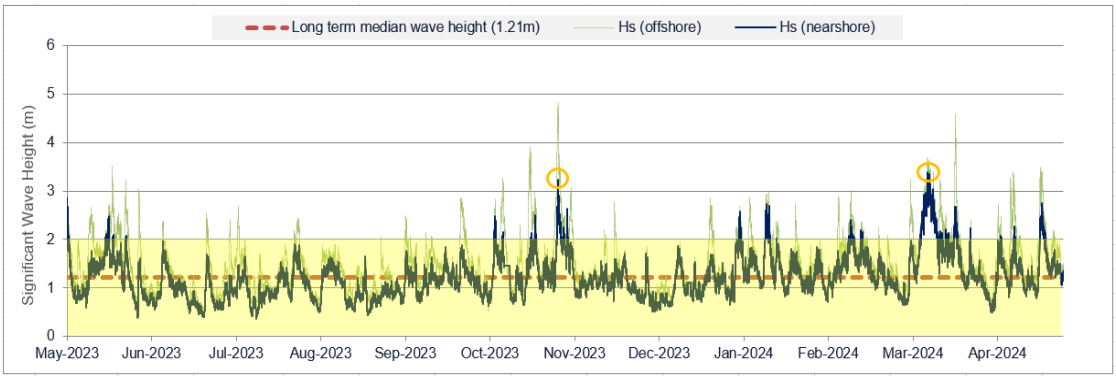


Figure 4 Tweed Heads offshore and nearshore buoys significant wave heights

Wave conditions are reported on a monthly basis in the Environmental Monitoring Summaries uploaded to the TSB website.

Tweed Sand Bypassing - Monthly monitoring summaries (nsw.gov.au)

That data has been collated and presented in Figure 5 for the reporting period.

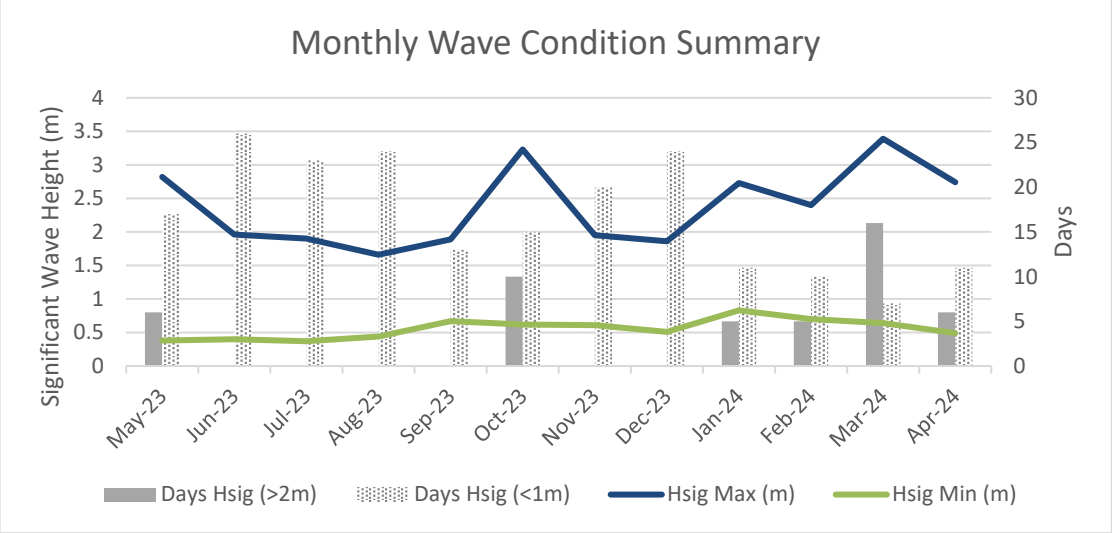


Figure 5 Tweed Heads nearshore buoy monthly wave parameter comparison

Significant wave heights (H_{sig}) ranged from 0.37-3.39m during the reporting period, with wave directions generally from ESE. There were only 48 days where H_{sig} was >2m. This is compared with previous reporting periods of 78 days *(May 2022 – April 2023)*, 82 days *(May 2021 – April 2022).*

Table 7 Comparison of annual wave parameters May 2020 to April 2024

Monitoring Period	Hsig Max (m)	Hsig Min (m)	Days Hsig (>2m)	**Days Hsig (<1m)**
May 2020 – April 2021	6.41	0.25	32	267
May 2021 – April 2022	5.33	0.34	82	173
May 2022 – April 2023	4.42	0.34	78	161
May 2023 – April 2024	**3.39**	**0.37**	**48**	**201**

An annual wave climate summary report is also produced by the Queensland Government is available on the TSB website.

Tweed Sand Bypassing - Coastal conditions

5.2 Tidal Analysis

A tidal harmonic analysis was undertaken in August 2024 by NSW Manly Hydraulics Laboratory (MHL) on three tidal measurement datasets: Letitia 2A at the Tweed River entrance, Coffs Harbour Jetty, and Mooloolaba at the Sunshine Coast. The analysis used data collected from continuous recording stations at the three locations. Data is available on MHL website https://www.mhl.nsw.gov.au/Station-201429.

A key metric monitored is Mean Low Water Springs (MLWS). A datum of 0.6 below AHD has been set at the Letitia 2A gauge. This level is considered a trigger for further investigation and monitoring of morphological changes to the entrance and potential impacts within the Tweed River Estuary, including wetlands and lower estuary shoals.

As with previous years, the recorded MLWS plane at Letitia 2A remained above -0.6 mAHD in each month of the reporting period as shown in Figure 6.

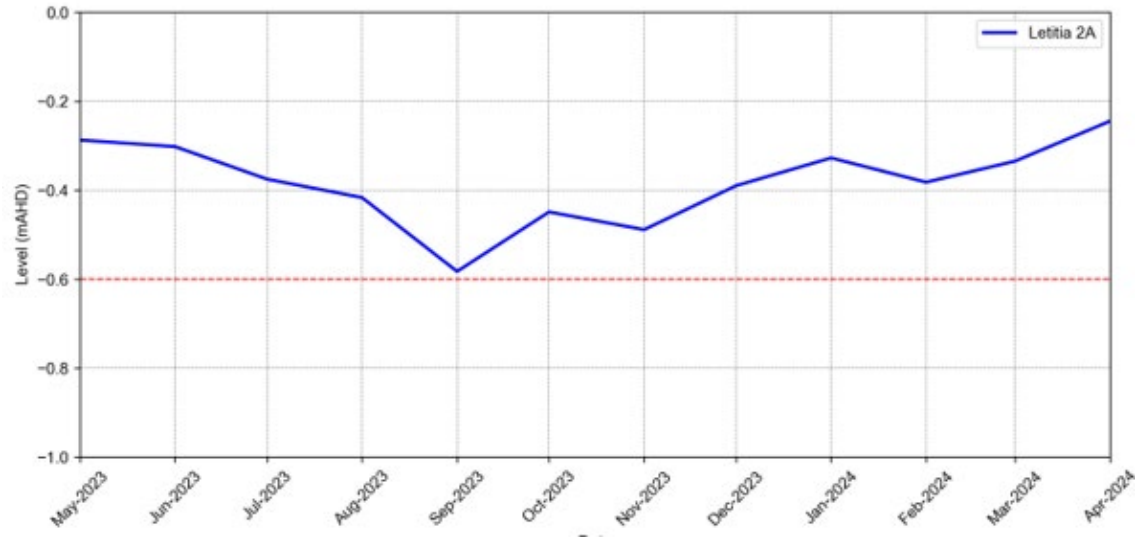


Figure 6 Mean Low Water Springs at Letitia 2A compared to the -0.6mAHD datum **(Manly Hydraulics Laboratory, 2024)**

The analysis concluded that no significant changes to the astronomical tidal response were observed, with all parameters remaining largely consistent to those of previous years and compared to the reference oceanic sites.

The 2023-2024 Tweed Sand Bypassing Tidal Analysis Report (MHL3072) can be found on the website.

Tweed Sand Bypassing - Coastal conditions (nsw.gov.au)

5.3 Sediment Transport Modelling

Summaries of indicative sediment transport rates are included in the monthly environmental reporting, Appendix A (item 4).

Figure 7 below shows the Letitia indicative longshore transport assessment, which compares pumping volumes with estimated transport volumes (Litpack) for the monitoring period. The data shows correlation between the pumping and modelled data. Monthly comparisons, as shown in Figure 8, highlight how wave conditions significantly influence transport rates, which result in the annual variability in LST.

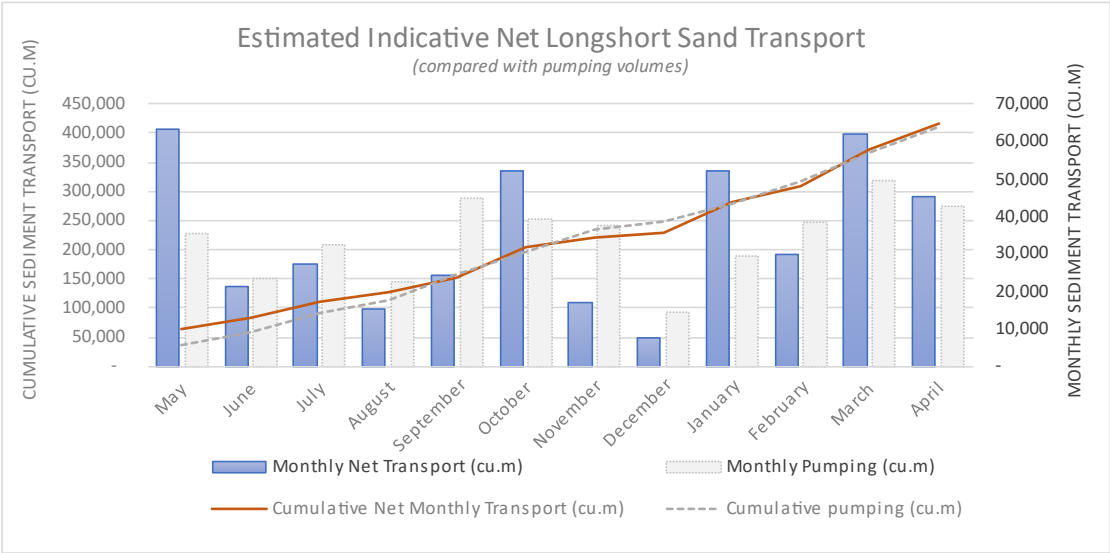


Figure 7 Estimated Indicative Net Longshore Sand Transport, May 2023 – April 2024

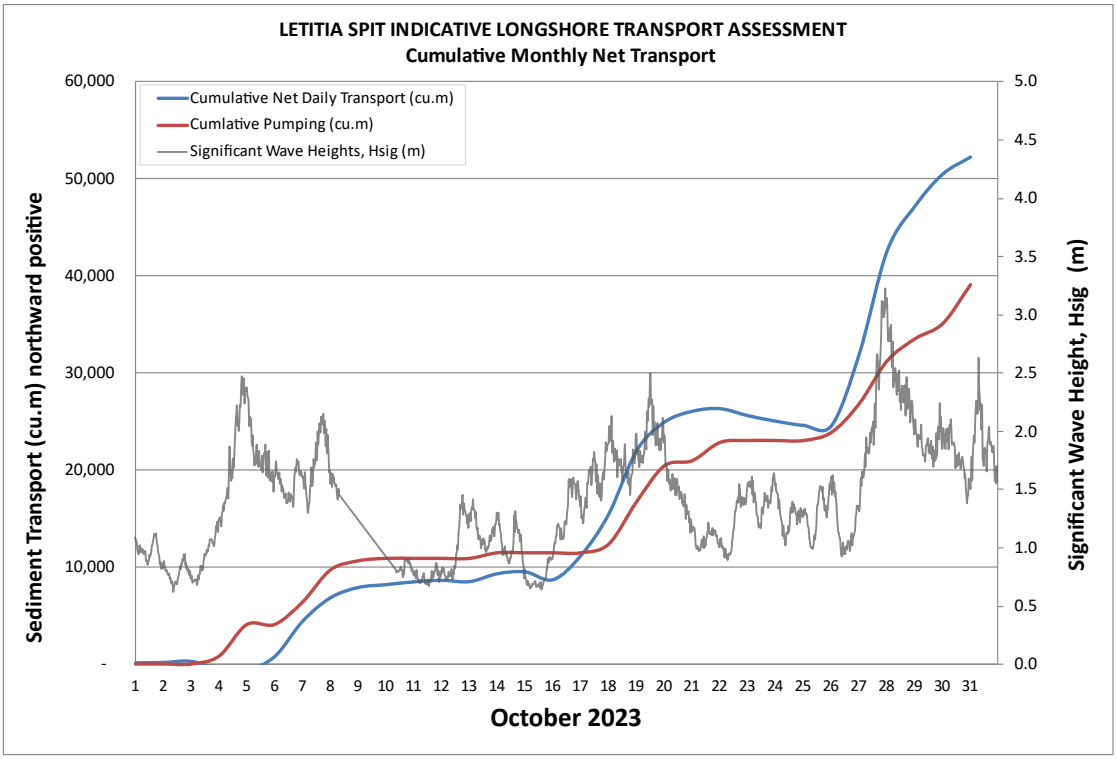


Figure 8 Pumping volumes compared against estimated transport rates, October 2023

5.4 Entrance Navigability

The entrance remained within the definition of a clear navigation channel as per the legislation during this monitoring period. Maintenance dredging undertaken between May and October 2023, removed a total of 259,527 m^3 of sand from the entrance to assist managing legislative requirements.

5.4.1 Vessel Usage

Marine Rescue NSW undertake daily vessel monitoring services on behalf of the project. A daily navigation rating (with respect to safety) is assessed in consideration of prevailing weather and environmental conditions on a scale from “impassable” to “good conditions”. The number of vessels crossing the Tweed River entrance on each day is recorded against the rating.

In comparison to the previous reporting year, the current monthly average for the number of vessels passing through the entrance per month has increased by 4.7 percent.

Although this source of data does not reflect the navigability of the river entrance, it demonstrates a growing interest in vessel participation.

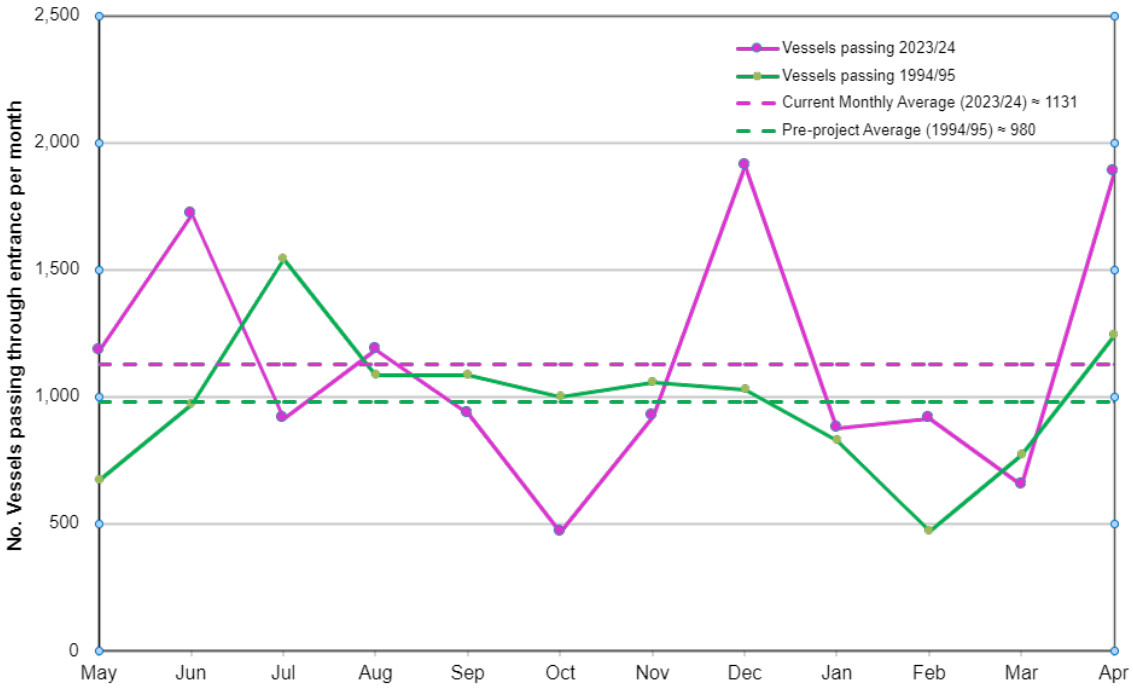


Figure 9 Vessels passing through entrance per month.

TSB report vessel crossing data, as displayed above, on a monthly basis as part of the monthly environmental monitoring summaries, refer Appendix A (item 4).

5.5 Back-passing

Back-passing operations commenced in 2019, with the REF limiting sand volumes to 50,000m^3 in total annually, with a further limit of 20,000m^3 at Dreamtime. Table 8 below shows the sand totals that have been delivered to Fingal and Dreamtime since the commencement of back-passing operations.

Table 8 Back-passing volumes from the commencement of back-passing in 2019.

Year		Contract Year (oct-sep)	Month	Location	Volume (m^3)
2019		CY18	August	Fingal	31,366
2020		CY19	August	Fingal	24,750
2021		CY20	September	Fingal	7,345
2022		CY21	August	Dreamtime	8,626
2023		CY22	June	Fingal	31,084
2023		CY22	Sep / Oct	Dreamtime	10,975

Potential impacts and benefits of placement at Final and Dreamtime is monitored through the full coastal survey program undertaken twice per year. Letitia Spit is broken up into 3 environmental reporting compartments, Letitia South, Letitia Central and Letitia North, refer Figure 10.

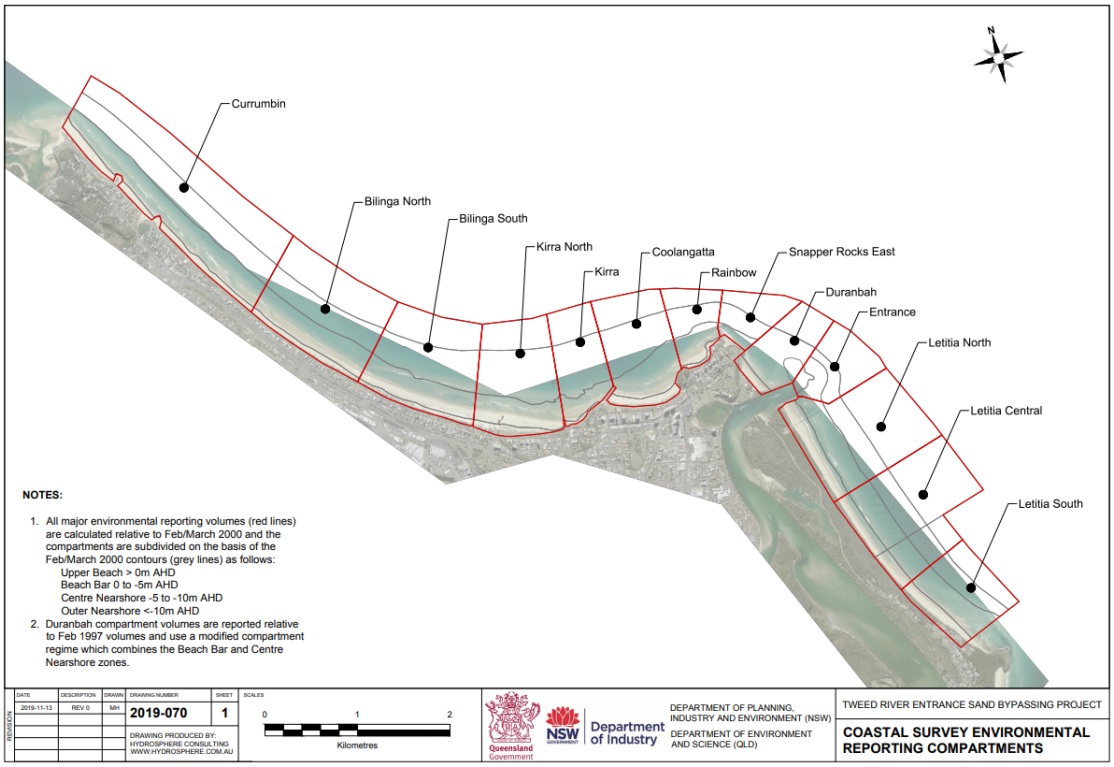


Figure 10 Coastal Survey Environmental Reporting Compartments

Volume monitoring is undertaken for each of the environmental compartments using the survey data captured. Volume monitoring allows trends to be established for natural coastal processes, seasonal variability and potential operational impact.

Letitia North and Letitia Central has the potential to be impacted by pumping operations, while Letitia South is influenced episodically by sand slugs that naturally move around the Fingal headland. These trends are shown in Appendix B, long-term compartment volume changes.

Since back-passing commenced, Letitia Central and Letitia North have been stable. There are small peaks in compartment volume changes at Letitia South after placement campaigns however these peaks aren't observed to impact any long-term trends.

Figure 11 to Figure 13 below show the volume changes at each of the 3 compartments since 2019 when back-passing commenced. Refer to Appendix B for long-term volume changes.

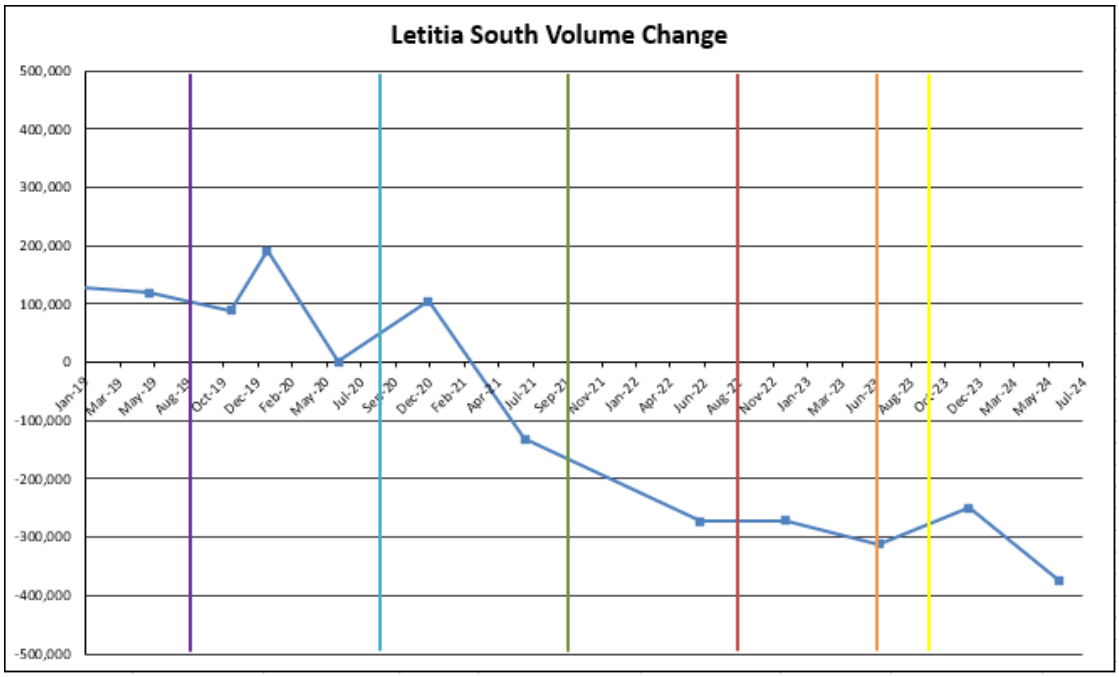


Figure 11 Letitia South Volume Change (2019-2024), Placement in accordance with **Table 8**

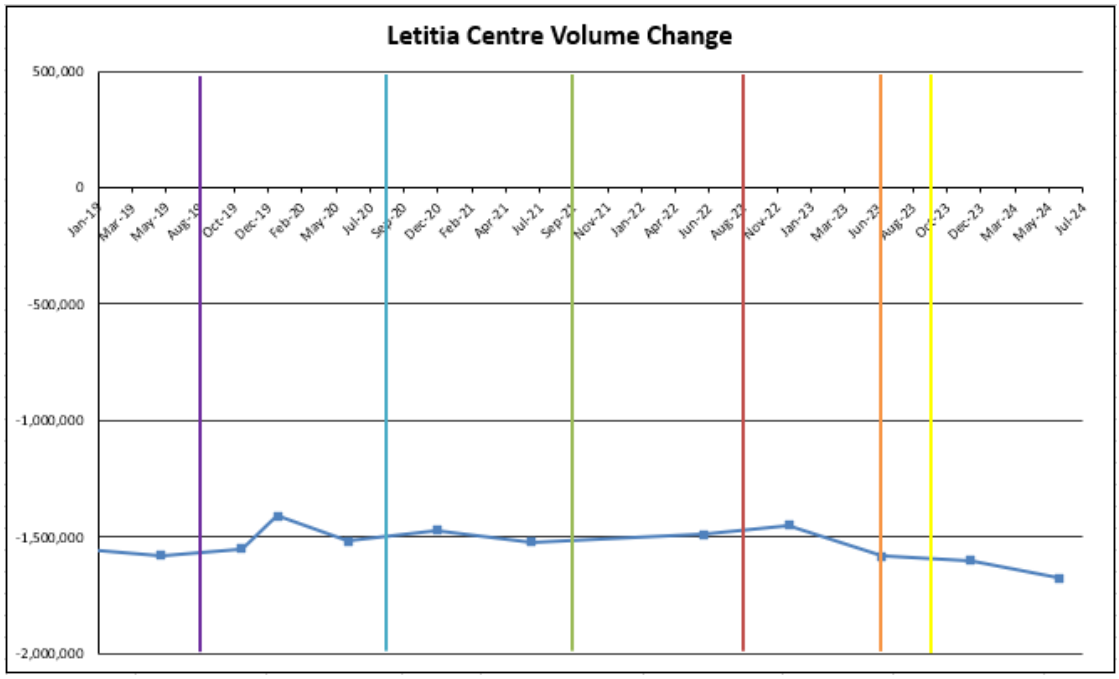


Figure 12 Letitia Central Volume Change (2019-2024), Placement in accordance with **Table 8**

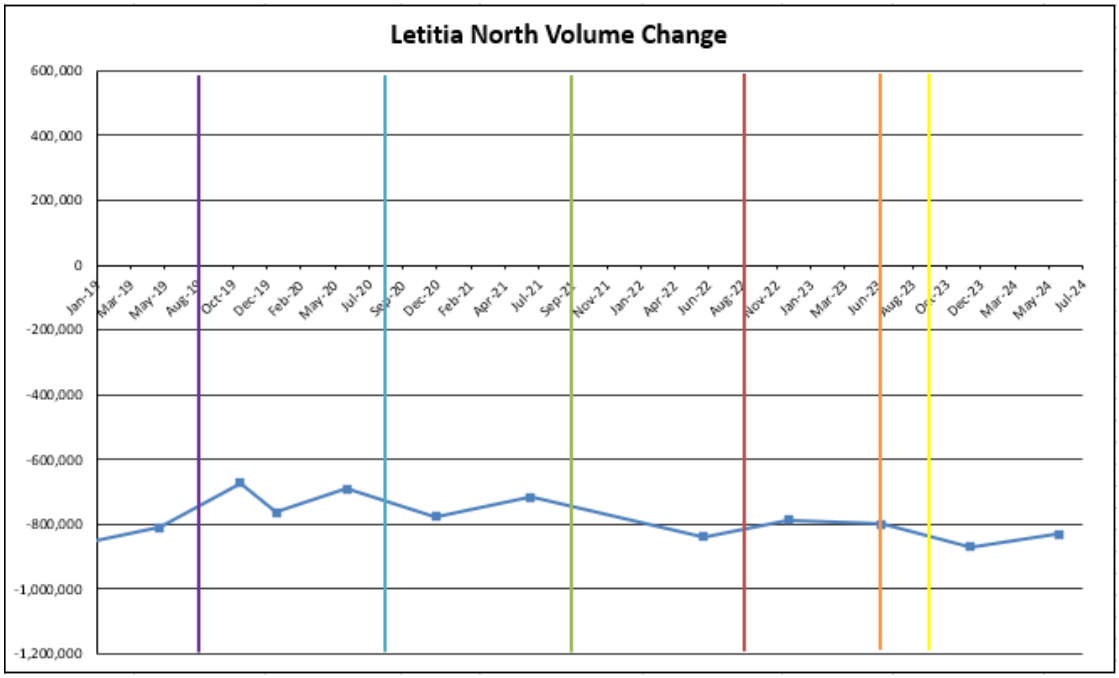


Figure 13 Letitia North Volume Change (2019-2024), Placement in accordance with **Table 8**

Back-passing impacts on longshore sediment transport are also monitored through tracking the Contract Quantity (CQ). CQ is defined in the Deed of Agreement (DoA) and can be summarised as, the cumulative quantity of sand which is to be delivered over time as per relevant calculations and clauses in the DoA or as otherwise agreed in writing by the Governments. The Long-Term Average (LTA) is a key metric used when forecasting CQ, with LTA being reassessed every 5 years. As of July 2024, the difference between total sand delivery and CQ was approximately 280,022 m^3.

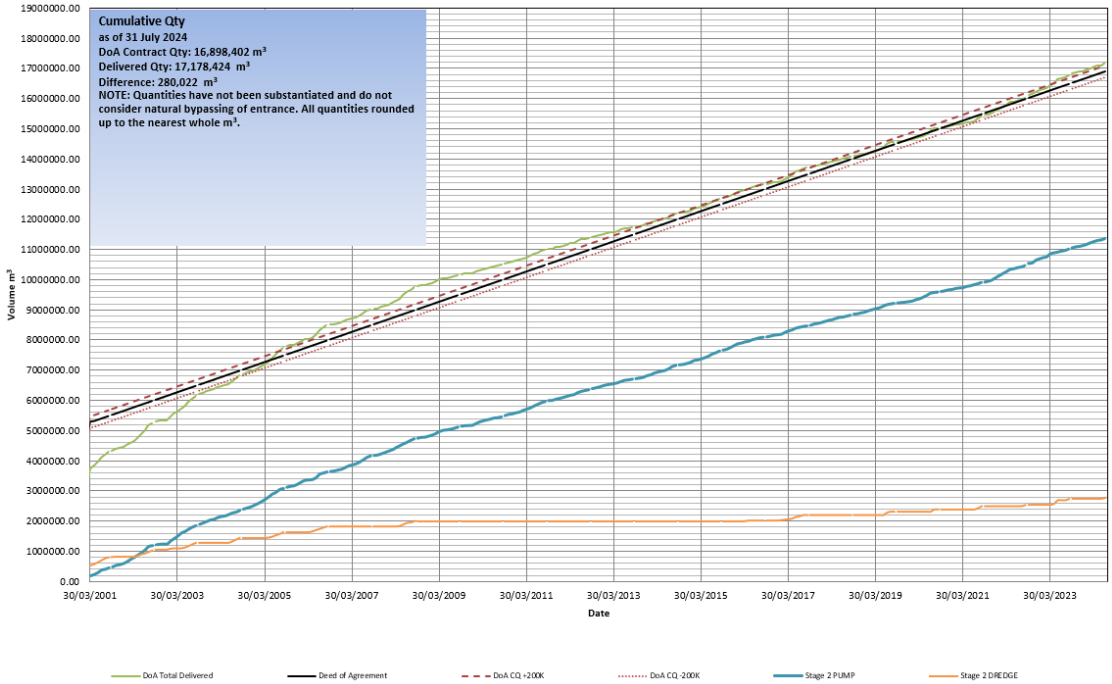


Figure 14 Comparison of CQ, DoA and DoA sand delivered

5.6 Beach Conditions and Response

Beach width and compartment volume analysis is undertaken and reported quarterly to the Advisory Committee, refer Appendix A (item 7) and Appendix B.

There were no instances of concerned feedback from Advisory Committee in relation to community sentiment around beach and surf amenity. Monitored metrics for beach and surf amenity (including beach width, imagery and compartment volumes) also remained within ranges previously observed to result in good conditions.

Monitoring of beach and surf amenity/condition for key locations is summarised below in a sample of oblique imagery and coastal imaging network outputs.

5.6.1 Rainbow Bay

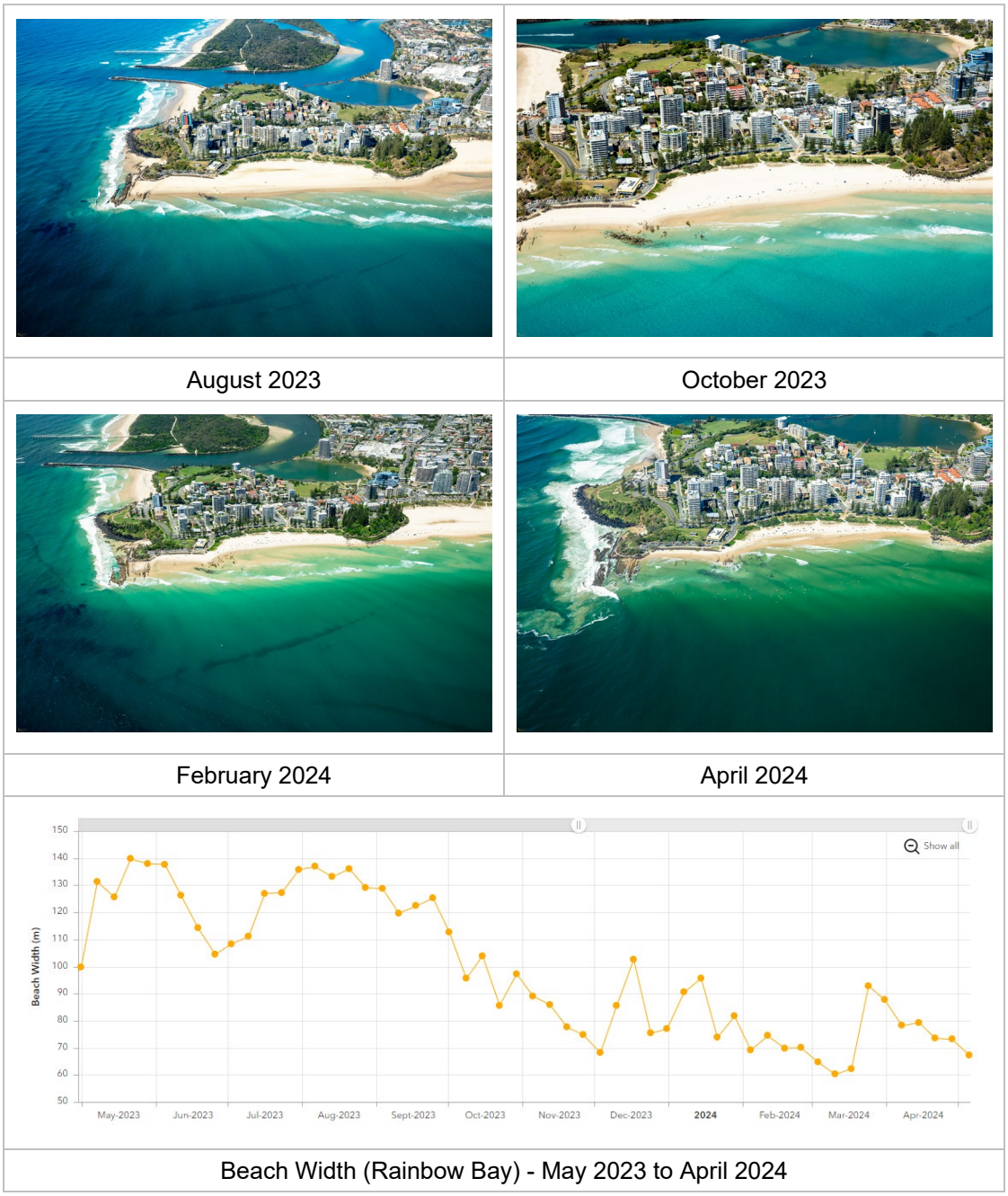


Figure 15 Rainbow Bay obliques and coastal imaging network beach width

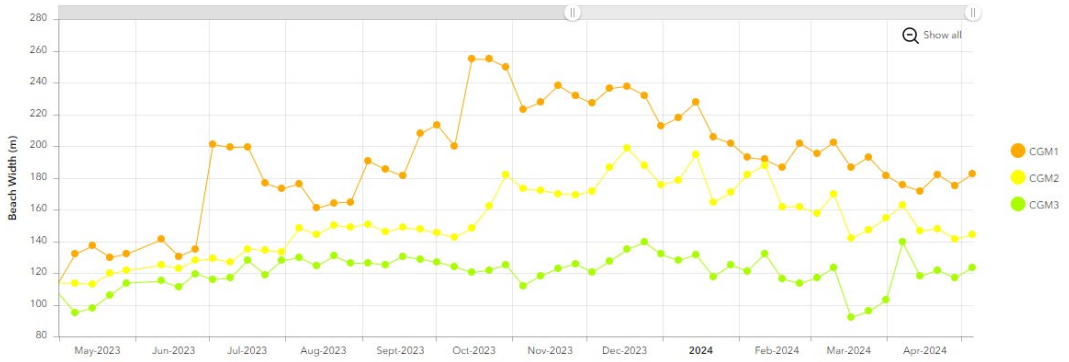
5.6.2 Coolangatta

August 2023

October 2023

February 2024

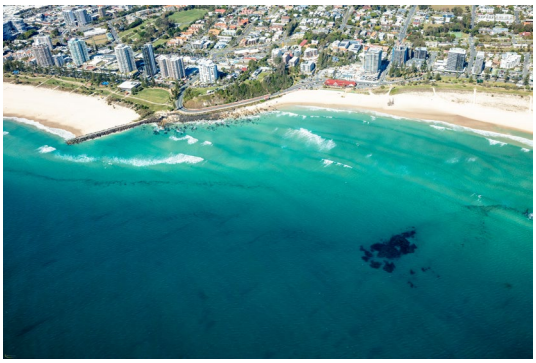
April 2024



Beach Width (Coolangatta) - May 2023 to April 2024

Figure 16 Coolangatta obliques and coastal imaging network beach width

5.6.3 Kirra

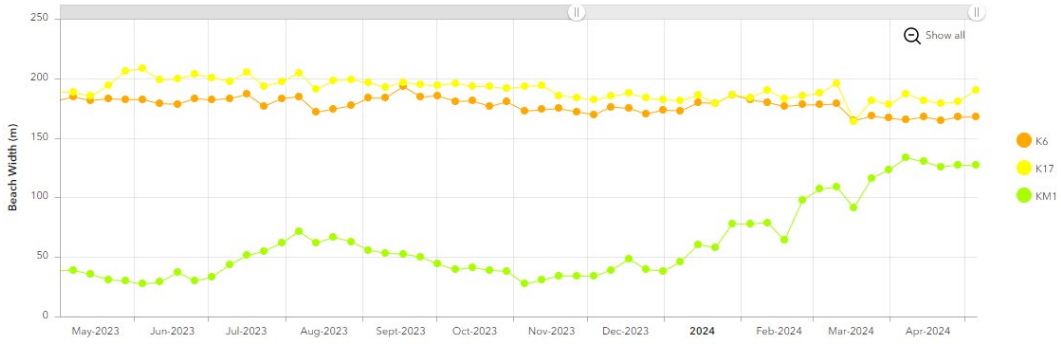


August 2023

October 2023

February 2024

April 2024



Beach Width (Kirra) - May 2023 to April 2024

Figure 17 Kirra obliques and coastal imaging network beach width

5.6.4 Duranbah (NSW)

March 2024 had a consistent strong E swell direction coupled with significant wave heights. The conditions affected the upper beach at Duranbah, with scarping observed off the southern corner and Tyalgum wreck and the rocky outcrops in the swash zone exposed briefly. Periods of calmer conditions throughout April allowed some level of beach building to occur, although the sediment transport rate was less than the April average.

To reduce the impacts of this event a sand nourishment campaign was undertaken for placement on the Duranbah upper beach via temporary pipeline during 10–30 May 2024. Although this was completed outside of the reporting period it demonstrates a response intervention and the following volumes were successfully delivered.

Table 9 Volumes delivered to Duranbah upper beach May 2024

Location	Volume (m^3)
Northern mound	7,580
Central mound	9,172
Southern mound	13,269
TOTAL	**30,021**

The surf amenity at Duranbah was maintained throughout the sand nourishment campaign.

Figure 18 Duranbah pre-nourishment (top), and post-nourishment (bottom)

5.6.5 Letitia Spit Shoreline Position

The EIS predicted that implementation of a permanent bypassing system would cause shoreline recession of Letitia Spit. This recession happened quite rapidly in the early phases of the project as shown in Figure 20 to Figure 21, where significant compartment volume decline in the first 9 years of operations is observed. Since approximately 2015, the shoreline has been brought to an observed stable equilibrium in accordance with operational objectives.

Letitia North and Letitia Central are considered within the zone of influence for pumping operations by the JMPS. Letitia South isn't observed to be impacted by the JMPS and is largely influenced by episodic sand slugs that move around Fingal headland, as can be seen by the trends in Figure 21.

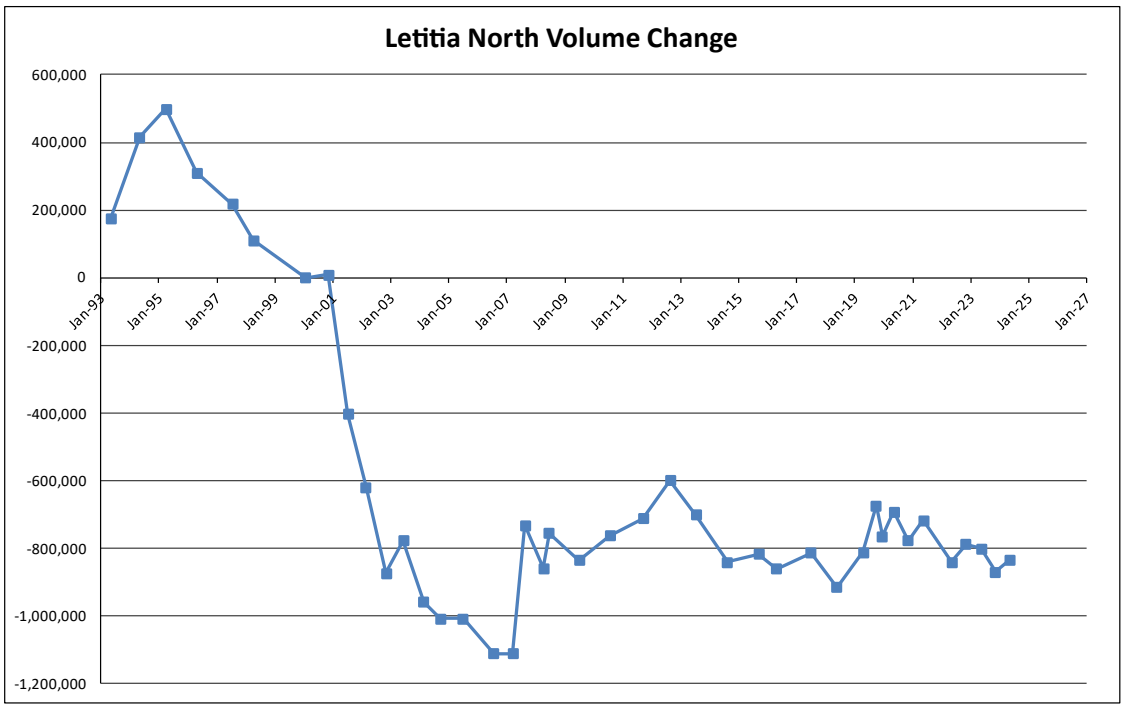


Figure 19 Letitia North Volume Change (1993 to 2024)

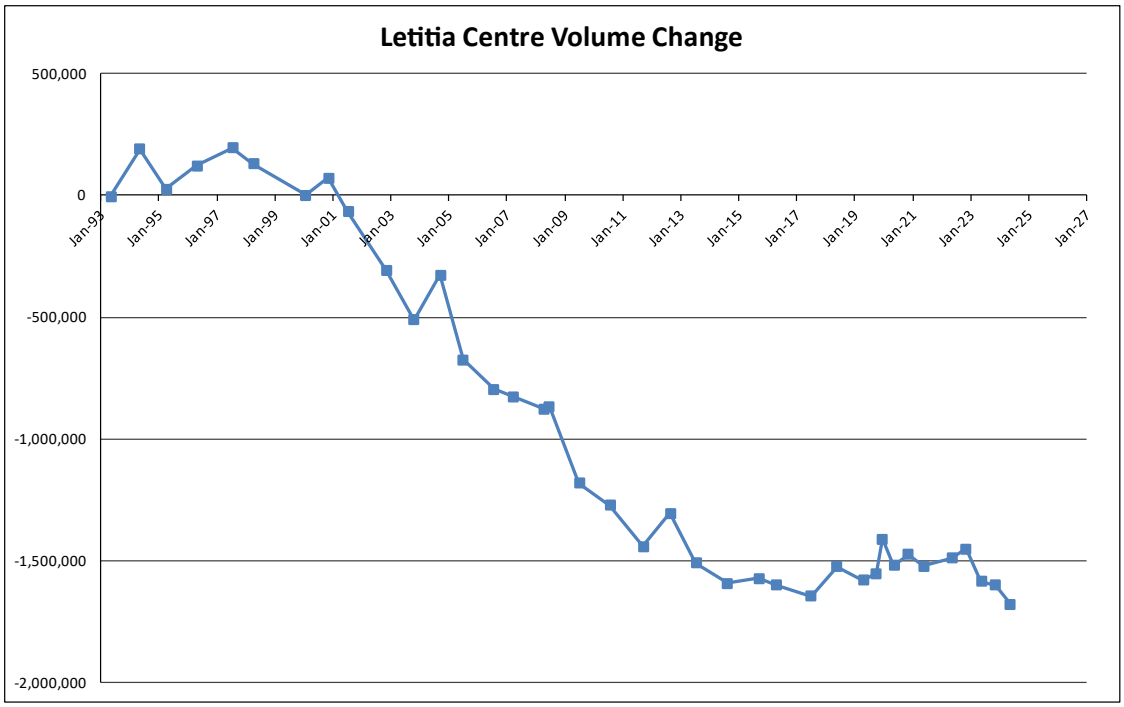


Figure 20 Letitia Central Volume Change (1993 to 2024)

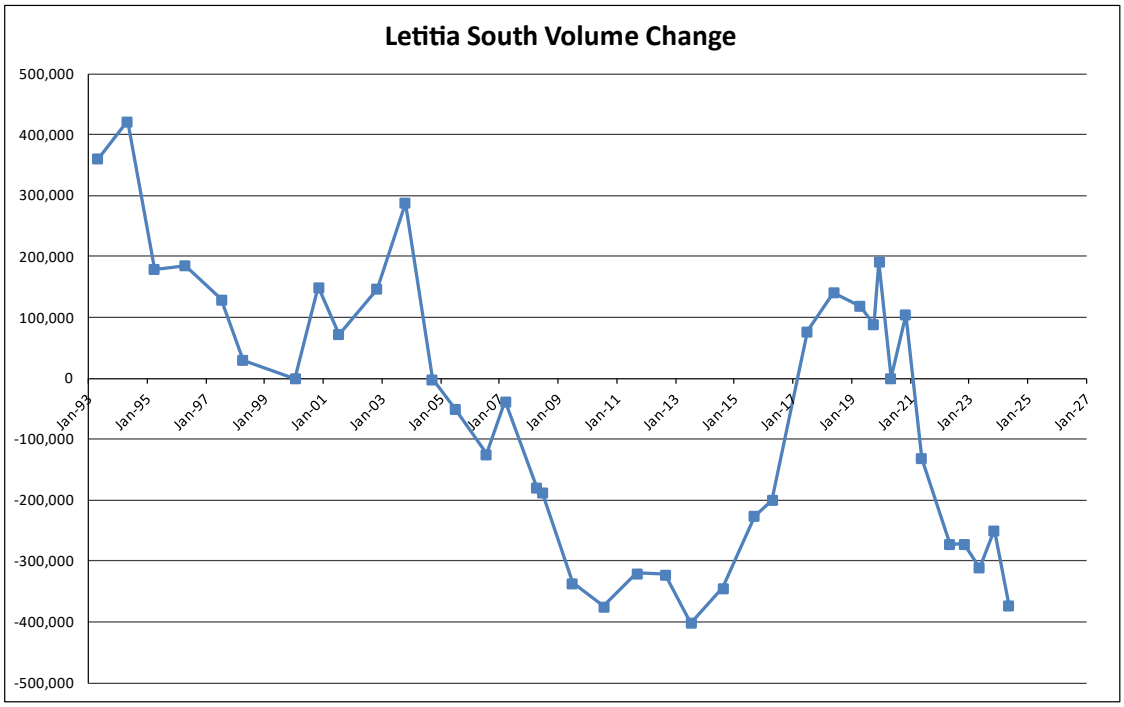


Figure 21 Letitia South Volume Change (1993 to 2024)

5.7 Reef Ecology and Extents

Reef monitoring field survey was completed in July 2024 to assess reef extents and potential ecological changes at Kirra Reef (Qld) and Cook Island (NSW).

Seagrass survey at Cook Island was also undertaken in November 2023 as a recommendation from the 2022-2023 Reef monitoring field survey.

Further seagrass survey will be undertaken at Cook Island to quantify the extent and coverage of seagrass, assess its condition, and continue to establish a baseline of data in November 2024.

The full monitoring report is available on the website.

Tweed Sand Bypassing - Reef monitoring (nsw.gov.au)

5.7.1 Kirra (Qld)

Monitoring reports from the earlier stages of the project show there were substantial changes in the aerial extent of Kirra Reef through time, with the maximum extent measured in 1995 (approx. 5900m^2 in northern section), declining to its lowest extent in 2008, then increasing again from 2010 and remaining relatively stable since 2012, refer Figure 22 below.

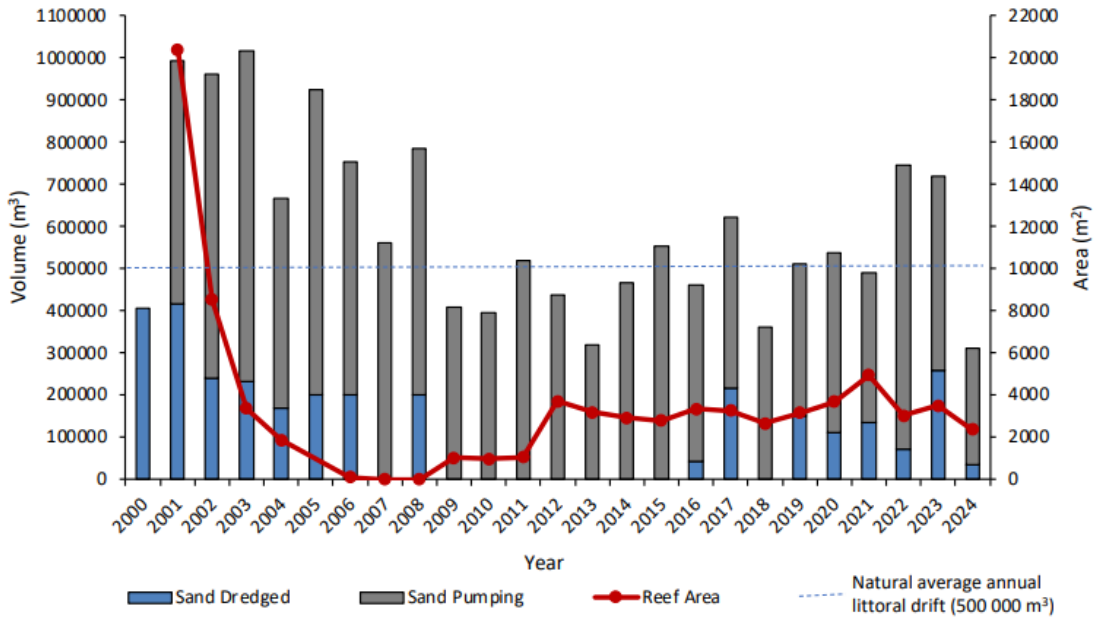


Figure 22 Estimated surface area (m^2) at Kirra Reef and total annual dredging and pumping volumes (m^3) between 2000 and 2024 (data for 2024 includes sand volumes up to end of July) (Source: Reef Biota Monitoring 2024, ESP).

The areal extent of Kirra Reef decreased over the past year from 3,492 m^2 in April 2023 to 2,365 m^2 in June 2024; however, remains within the relatively stable reef extent observed since 2012. This change in reef area was likely due to an offshore sandbar, as TSB pumping operations were consistent over the last year (Ecological Service Professionals (ESP), 2024).

The inner western and eastern sections of Kirra Reef were not uncovered in June or July 2024, but aerial images indicate outcrops in the eastern section were uncovered in August 2024. These inner reef sections have a very low profile (or relief) and are normally subject to increased frequency of physical disturbance, including sand burial following the normal migration of the offshore bar along the beach (Ecological Service Professionals (ESP), 2024).

The offshore sandbar can be clearly seen in oblique imagery captured in August 2024 (Figure 23 to Figure 25), with extents of this sandbar extending south past Fingal head and north of Currumbin. Well outside the boundaries of operational influence by dredging or pumping.

Figure 23 Kirra oblique imagery captured August 2024.

Figure 24 Fingal oblique imagery captured August 2024.

Figure 25 Currumbin oblique imagery captured August 2024.

Further analysis of hydrographic survey was undertaken of the Kirra environmental monitoring compartment to assess sand volume changes against reef extents. An increase in sand volume at Kirra was observed during 2024, however the volume change is still within volume ranges observed at Kirra since 2009, a period where reef extents have been considered stable.

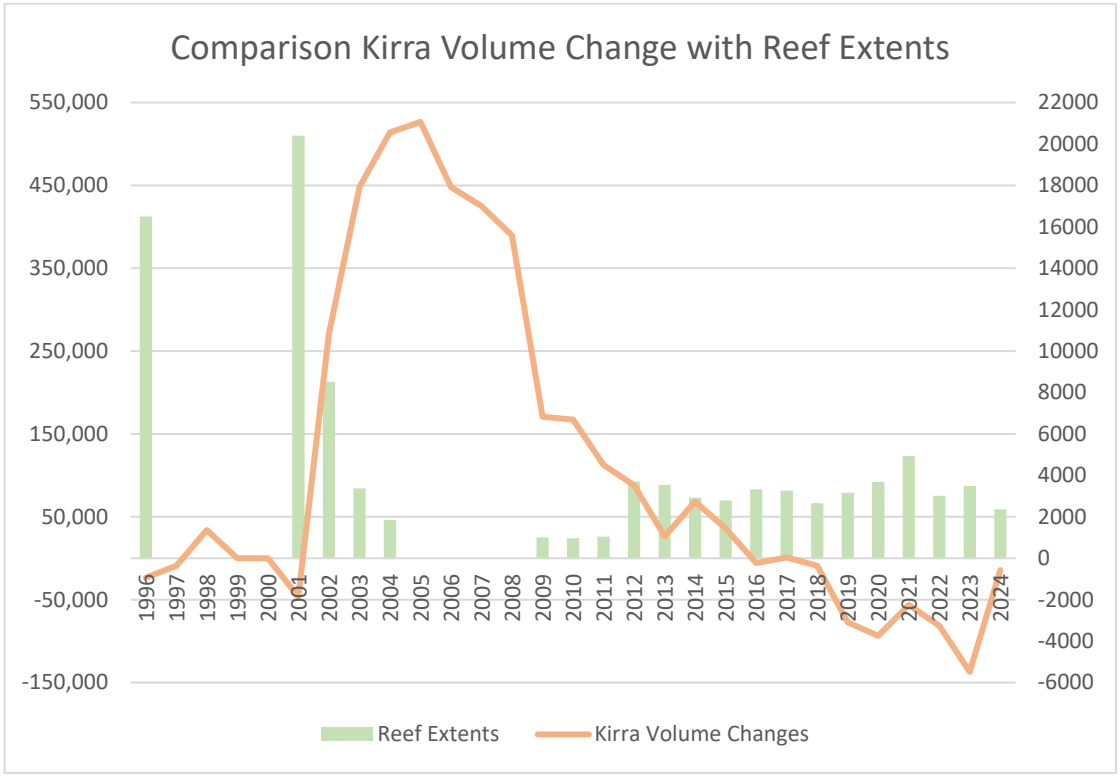


Figure 26 Comparison of Kirra compartment volumes with reef extents

Variability in reef communities year to year, often linked to migration of an offshore bar, has been noted, however Kirra Reef is becoming more diverse and more similar to reefs in the area. In recent years (since 2016) benthic communities at Kirra Reef have been relatively stable (Ecological Service Professionals (ESP), 2024).

5.7.2 Cook Island (NSW)

Seagrass was recorded between 2020 and 2022 at Cook Island West and was observed again in 2023, however the coverage had declined. Likely cause noted was prolonged recovery following flood impacts.

The REF for back-passing noted that, *"the habitat in the proposal area and adjacent habitats is a high energy coastal area of open beach that is not suitable for the establishment of seagrasses."* The Reef Biota Monitoring Report (Ecological Service Professionals (ESP), 2024), recommended a baseline of seagrass communities be established with annual monitoring to be undertaken in November. TSB adopted this recommendation and engaged ESP to conduct a seagrass survey in November 2023.

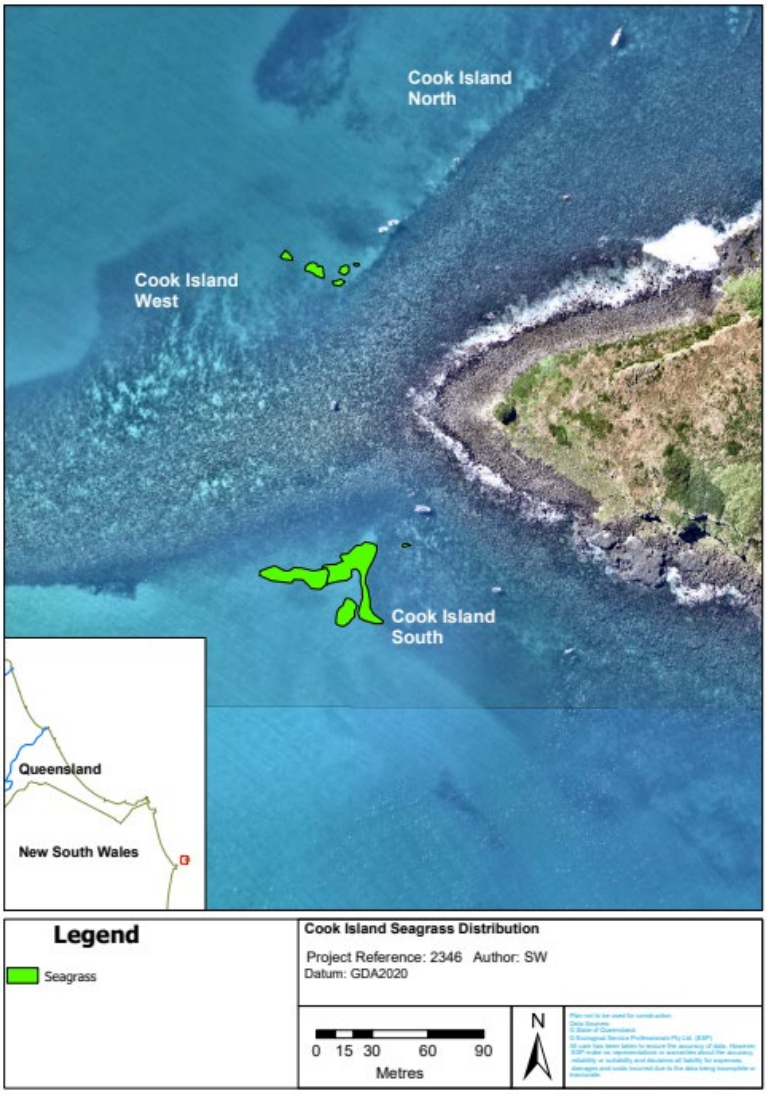


Figure 27 Cook Island Seagrass Distribution (Source: Seagrass Distribution 2023, ESP).

In November 2023, seagrass was recorded on the north-western and south-western sides of Cook Island (in approximately 7 to 9 m water depth) and covered a total area of 958 m^2 (Ecological Service Professionals (ESP), 2023).

Seagrasses are sensitive to environmental changes and given the spatial variability in extent and cover and limited comparative sites, further baseline mapping will continue in November 2024 to continue to build a useful dataset for comparative analysis.

Benthic communities and fish assemblages were consistent with past surveys.

5.8 Tweed River Lower Estuary Conditions

An assessment of the Lower Estuary Shoals and Wetlands extents was not triggered in this reporting period based on the results of tidal harmonic analysis at Letitia 2A gauge, which reported no significant changes in astronomical tidal response.

Refer Annual Report 2022-2023 for lower estuary and wetland extents history, which can be found on the Tweed Sand Bypassing website under Management Plans and Reports.

Tweed Sand Bypassing - Operations (nsw.gov.au)

5.8.1 Lower Estuary Shoals

TSB did however utilise the LiDAR survey dataset provided by the CSIRO to complete bathymetric mapping of the Lower Tweed River.

A survey comparison indicates that the shoals have been building during the reporting period.

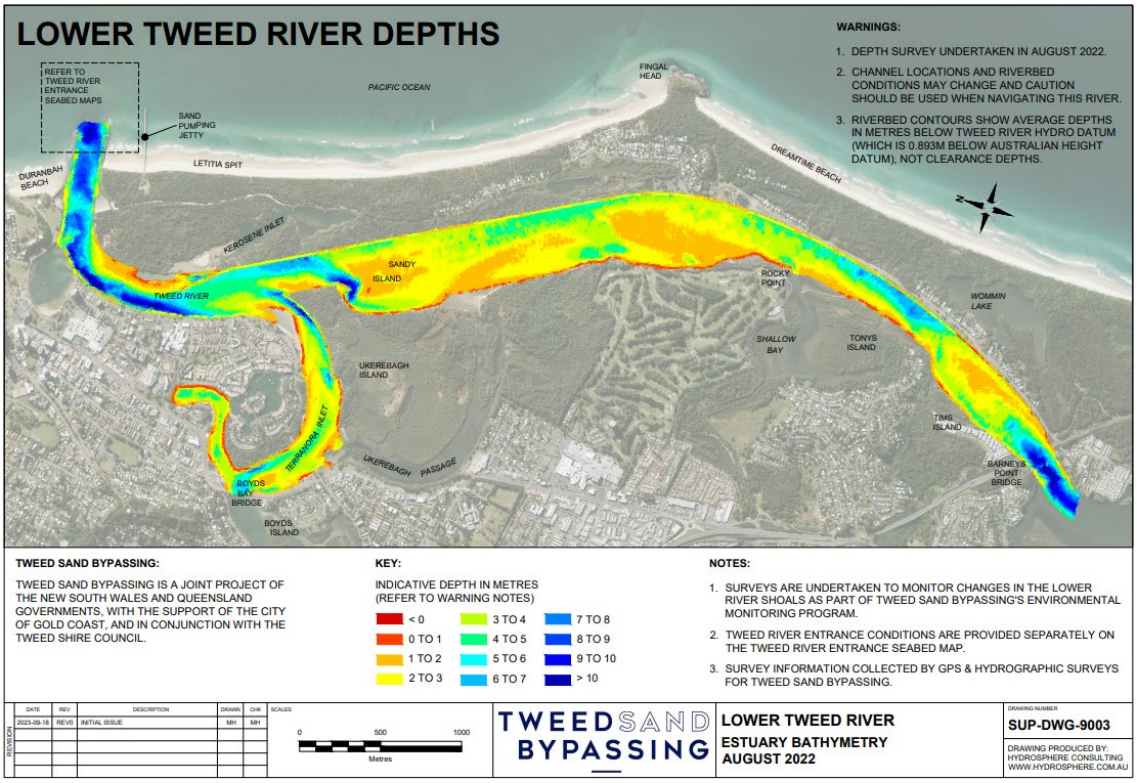


Figure 28 Lower Tweed River Bathymetry, August 2022.

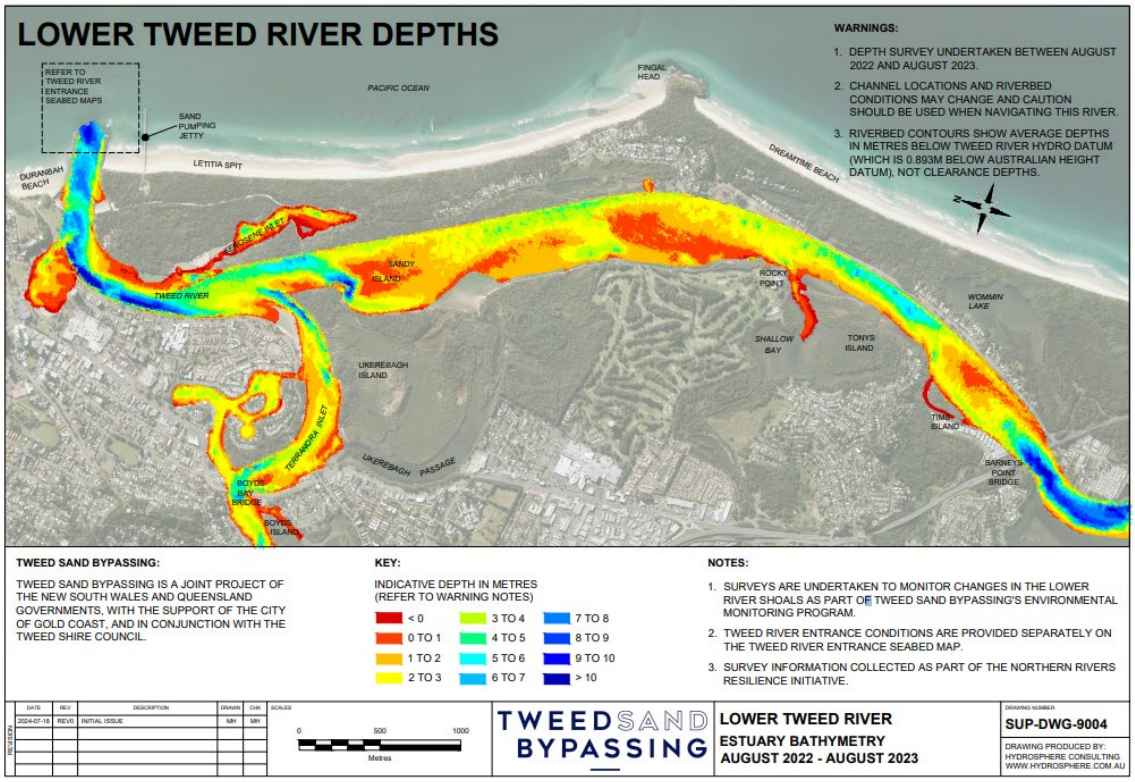


Figure 29 Lower Tweed River Bathymetry, August 2023.

PDF versions of the Lower Tweed River Estuary Bathymetry can be accessed through the website.

[Tweed Sand Bypassing - Surveys (nsw.gov.au)]

5.8.2 Wetland Extents

Wetland extent mapping was undertaken every year for the first 5 years of operations with the frequency to reviewed thereafter.

As detailed in last year's annual report, wetland impacts were predicted to occur from scouring of the lower estuary shoals as a result of flood events and/or long-term changes in tidal regimes.

Based on the results from tidal analysis (refer section 5.2) and no evidence of shoal scouring, wetland extent mapping was not triggered for the monitoring period.

6 Community engagement and complaints

TSB review consultation requirements annually to ensure any changes to legislation are captured and the correct stakeholders are being engaged with. There were no changes to legislation or other indicators that triggered changes to consultation requirements.

6.1 Communication channels

The TSB utilises various platforms to engage and communicate key project activities and information within the local community. Communication channels include:

- Instagram @tweedsandbypassing and TSB App
- Website https://www.tweedsandbypass.nsw.gov.au/
- Facebook via TfNSW
- Community events (i.e. World Surf League)
- Advisory committee- AC (comprising elected members of community and representatives from Governments)

6.2 Instagram and TSB App

Communications were released on Instagram and the TSB App throughout the reporting period, covering the following project information and updates:

Table 10 Summary of Instagram and App communications

Date	Project Information
05 May 2023	Pre-dredge notification (MODI R)
10 May 2023	Attendance at Gold Coast Pro notification
30 May 2023	Dredging Update (MODI R)
27 Jun 2023	Dredging Update (MODI R)
05 Sep 2023	Dredging Update (TRUD R)
15 Sep2023	Dredging commencement notification (TRUD R)
04 Oct 2023	Dredge completion notification
23 Oct 2023	New signage update
02 May 2024	Duranbah nourishment campaign notification

The app also provides live footage of the Tweed River Entrance, Tweed River, Rainbow Bay and Kirra.

6.3 Website

The TSB website was updated throughout the reporting period, with environmental monitoring including sand delivery volumes and reef monitoring, community information such as Advisory Committee meetings, Schools Package and Dredging campaign information.

Additional information available on the website includes project background and publications and studies.

6.4 Focus Group Sessions

The following focus group sessions were held through the reporting period.

Table 11 Summary of focus group sessions

Date	Audience
April 2024	Tweed Shire Council City of Gold Coast Department of Climate Change, Energy, the Environment and Water National Parks and Wildlife (NSW) Fisheries (NSW)

6.5 AC

During the reporting period, AC meetings were held in:

- May 2023,
- August 2023,
- November 2024, and
- February 2024.

Meeting minutes are available on the TSB website, see Appendix A (item 9).

6.6 Media

TSB were mentioned in the media on several occasions throughout the monitoring period:

- May 25, 2023, Tweed Valley Weekly – Sand pumping concerns
- June 16, 2023, ABC NEWS, ABC Sport - How sand pumping helped shape Gold Coast's Superbank, one of Australia's most famous surf breaks (msn.com)

6.7 Complaints

Validated and written complaints received by the Governments arm of the TSB are recorded in TSB's deocument management system.

No complaints regarding TSB operations were received during the reporting period.

7 Review and Improvement

7.1 Independent Audit

In accordance with MCoA 16 the 5 yearly Independent Environmental Audit was undertaken in February 2024. There were three (3) non-compliances and two (2) recommendations from that audit, as outlined below:

Table 12 Independent Audit Non-Compliances and Recommendations

NC / Rec	Description	Comments
NC1	Failure to review and update EMP's and provide a timely response to directives from the Department of Planning in relation to EMP updates.	***Auditor:*** While a non-compliance is noted the auditor notes that this non-compliance has not resulted in any environmental or community impacts. ***TSB:*** TSB have been working with DPHI in regards to EMP updates and timing of the submission of a new framework as TfNSW assume operations on 1 October 2024.
NC2	Timely delivery of Annual Reports to listed Government Stakeholders.	***Auditor:*** Systems within TfNSW and the project team have been implemented to better monitor tracking and receipt of the Annual Environmental Management Reports. ***TSB:*** All annual reports for the audit period were distributed to listed Government Stakeholders on 22 February 2024.
NC3	Maintaining of depth in the Tweed River Entrance.	***Auditor:*** As reported in the Annual Environmental Reports, clear navigational channel depth was maintained throughout 2018, 2019, 2020 but was not maintained between: • 26 Jul 2021 - 10 Sep 2021 • 18 Jun 2022 - 09 Nov 2022 • 26 Jan 2023 - 13 Apr 2023. Over laying the Concession Agreement the only period where the operations was outside of its contractual and legislated requirements in terms of channel depth was in 2022 and this was following the substantial floods of 2022 and a period of high sediment transport. ***TSB:*** This is an EIS requirement and is instantaneous in nature, with a non-compliance recorded when a channel depth is not maintained. Factors such as legislation, contractual requirements and unprecedented weather influence compliance with this requirement. TfNSW operational control and the TSB Management System will provide greater certainty of effective channel management.
RE1	Modify the Conditions of Approval (1999) to suitably represent the current steady state operations, observed and current impacts, legislative conditions, objectives and project boundaries. When working with the Department and Stakeholders TfNSW is recommended to propose to modify or remove Conditions that sit outside of current delivery approach or project influence, based upon evidence gathered during decades of operation. Incorporate changes into the new EMS, EMP's and subplans.	***Auditor:*** The 1998 Conditions of Approval do not suitably represent the current project status. ***TSB:*** TSB have been liaising with DPHI in relation to a modification for some time. It was eventually brought to our attention that Tweed Sand Bypassing needed to be classified as State Significant Infrastructure (SSI) to undertake a modification. That classification was achieved in March 2024. TSB intend to work with relevant stakeholders over the next year to investigate the benefits of pursuing a modification.

RE2	Reassess the use of the EIS predictions on this project as a tool for determining operational performance and current environmental impact. The EIS was completed in 1998 and prior to system design and approach finalization. The Project has demonstrated through the audit that it has a very mature approach based upon decades of monitoring, specialist studies and project gained understanding of the coastal process.	***Auditor:*** The project, environmental, community and Regulatory value of ongoing reviews against the 1998 EIS predictions is identified to be limited. ***TSB:*** Intend to consider this as part of the modification investigation.

7.2 Actions required from previous annual review (May 2022 to April 2023)

Table 13 2022-2023 Actions Summary

Actions from 2022-2023	Close out comment
Continue with Environmental Monitoring and consult with Project partners and Local communities to deal with any arising issues.	On-going.
Continue to monitor long-term recession behaviour at Letitia, and refine pumping strategy where opportunities are identified.	On-going.
Complete the Independent Audit for monitoring period May 2018 to April 2023.	Complete.
Finalise forward planning pathway to address the revision of the EMS-Operations and subplans and undertake stakeholder engagement, including amending the frequency of monitoring activities to align with EIS expectations after 10 years of operations and SME recommendations.	EMP and supporting plans have been developed, consultation with stakeholders commenced in April 2024.
Seek further advice on the appropriate response to monitoring seagrass meadows off Cook Island West when planning placement at either Dreamtime or Fingal placement areas.	Baseline monitoring of seagrass planned to commence in November 2024 and will include report recommendations for monitoring during placement campaigns as part of on-going monitoring program.

7.3 Activities to be completed in next reporting period

Table 14 2024-2025 Activities Summary

Activities for 2024-2025	Comment
Continue with Environmental Monitoring and consult with Project partners and Local communities to deal with any arising issues.	On-going.
Continue to monitor long-term recession behaviour at Letitia, and refine pumping strategy where opportunities are identified.	On-going.
Undertake analysis of survey compartments south of Letitia, including Final and Dreamtime.	Survey at these locations commenced in 2020 as part of back-passing operations. The data set can now start to be formed to analyse any potential trends.
Implement approved EMP and supporting plans.	Approval of EMP and supporting plans obtained September 2024.
Establish a baseline of shorebird habitat now Letitia Spit has stabilised.	Commence scoping requirements and consultation early 2025.

8 References

Ecological Service Professionals (ESP). (2023). *Seagrass Distribution Cook Island Aquatic Reserve.*

Bluecoast Consulting Engineers. (2022). *Letitia Beach Behaviour Report.*

Department of Primary Industries. (2023, August 25). *Department of Primary Industries*. Retrieved from Estuarine Habitat Dashboard: https://nsw-dpi.shinyapps.io/NSW_Estuarine_Habitat/

Ecological Service Professionals (ESP). (2024). *Reef Biota Monitoring 2024 Tweed Sand Bypass.*

Hyder Consulting Pty Ltd, Patterson Britton Partners Pty Ltd and WBM Oceanics Australia. (1997). *Tweed River Entrance Sand Bypassing Project, Permanent Bypassing System - Environmental Impact Statement / Impact Assessment Study.*

Hydrosphere Consulting. (2017). *Coastal Management Program for the Tweed River Estuary: Ecological Assessment.*

Hydrosphere Consulting. (2022). *Tweed River Estuary: Coastal Management Program 2022-2032.*

Manly Hydraulics Laboratory. (2024). *Tweed Sand Bypassing Tidal Analysis MHL3072.* Manly Vale NSW.

Manly Hydraulics Laboratory, NSW Government. (2023). *Tweed Sand Bypass Tidal Analysis 2022-23.*

NSW Environment Protection Authority (EPA). (2021). *NSW State of the Environment 2021.*

NSW Government. (2010). *State of the Catchments 2010, Overview Northern Rivers Region.* Department of Environment, Climate Change and Water.

NSW Government. (2022). *2022 Flood Inquiry, Volume Two: Full Report.*

Queensland Government. (2023). *Tweed Heads / Brisbane Wave Climate Annual Summary 2022-2023.*

Tweed Sand Bypassing, TfNSW. (2023, August 25). Retrieved from Tweed Sand Bypassing: https://www.tweedsandbypass.nsw.gov.au/

Appendix A

Supporting Information - website

https://www.tweedsandbypass.nsw.gov.au

Tweed Sand Bypassing proactively manage a project website to ensure the latest available data and information is provided to stakeholders and the community on a easily accessible public platform.

Below is a summarised list of the key analytics found on the website that support this annual report, with website links provided. This information can be downloaded from the website and collated with the report for your records.

Table A Summary of supporting information

Item No.	Analytic	Summary	Website Link
1	Wave Climate	The Queensland Government carries out wave monitoring on behalf of the TRESBP. Annual wave climate summary reports from the wave recording of Tweed Heads and Brisbane Waverider buoy sites are published by Queensland Government.	Tweed Sand Bypassing - Coastal conditions (nsw.gov.au)
2	Tidal Analysis	The NSW Department of Planning, Housing and Infrastructure (DPHI) through the Manly Hydraulics Laboratory (MHL) undertakes tidal data analysis for the TRESBP. This work has been undertaken since 2000 to determine if there are any major changes in tidal behaviour of the estuary due to the sand bypassing operations. The study consists of a tidal harmonics analysis for three locations on the Eastern Australia coastline. The latest tidal analysis report is available for download on the website.	Tweed Sand Bypassing - Coastal conditions (nsw.gov.au)
3	Reef Monitoring	Ecological monitoring of Kirra Reef has been conducted for the project intermittently since operations began in 2001. Cook Island has also been monitored as a control for each study and more recently as an independent site. A report has been produced annually since 2014. The latest reef monitoring report is available for download on the website.	Tweed Sand Bypassing - Reef monitoring
4	Monthly Environmental Monitoring	Monthly environmental monitoring reports are developed and published online every month, outlining: ✓ Sand delivered by pumping and dredging ✓ Wave conditions including min and max H_{sig} for the month and directional wave roses ✓ Modelled v actual (pumping) sediment transport ✓ Beach and surf amenity observations ✓ Tweed River Entrance usage data	Tweed Sand Bypassing - Monthly monitoring summaries (nsw.gov.au)
5	Aerial Photography	Vertical aerial photography of the project coastline area is captured twice per year, on the same dates (subject to weather and ocean conditions) in autumn and spring. The photography provides excellent information on	Tweed Sand Bypassing - Aerial Photography (nsw.gov.au)

		beach changes. Oblique aerial photography is captured every three months to cover the project area extending from Kingscliff in NSW to Currumbin in Queensland.	Tweed Sand Bypassing - Aerial Photography - archive (nsw.gov.au)
6	Beach Photos	Photographs of five beaches within the Tweed Sand Bypassing project area have been taken every couple of months since the project was commissioned in 2001. They are an excellent indication of the degree of beach width fluctuation.	Tweed Sand Bypassing - Beach Photographs (nsw.gov.au)
7	Beach Width and Compartment Volume	The University of New South Wales Water Research Laboratory maintains a coastal imaging system on behalf of TSB (ARGUS). Sixteen fixed land-based cameras at four different locations collect and analyse images to provide quantitative data about shoreline movement. Detailed shoreline position information is also available, with the data showing the relative change in shoreline position over time, given as meters from a common reference point. Further data can also be found in Appendix B.	Tweed Sand Bypassing - Beach width monitoring (nsw.gov.au)
8	Survey	Tweed Sand Bypassing relies on detailed marine and beach survey information to analyse how the beaches are changing in response to sand delivery and natural seasonal fluctuations. The latest entrance, full coastal and Tweed River surveys are available online. For the register of all surveys undertaken during the monitoring period, refer to the survey register in Appendix C.	Tweed Sand Bypassing - Surveys (nsw.gov.au)
9	Meetings and presentations	The States of New South Wales and Queensland have acknowledged the importance of community input to the Tweed River Entrance Sand Bypass Project [TRESBP] through its various stages of development and continuing operation. To ensure that such consultation is incorporated within the management framework the States initiated a range of measures including the formation of a TRESBP Advisory Committee. The committee is the primary mechanism for communications between the TRESBP and the local community and stakeholders and provides advice on matters of relevance to the local community associated with ongoing operations and the consideration of	Tweed Sand Bypassing - Community Advisory Committee (nsw.gov.au)

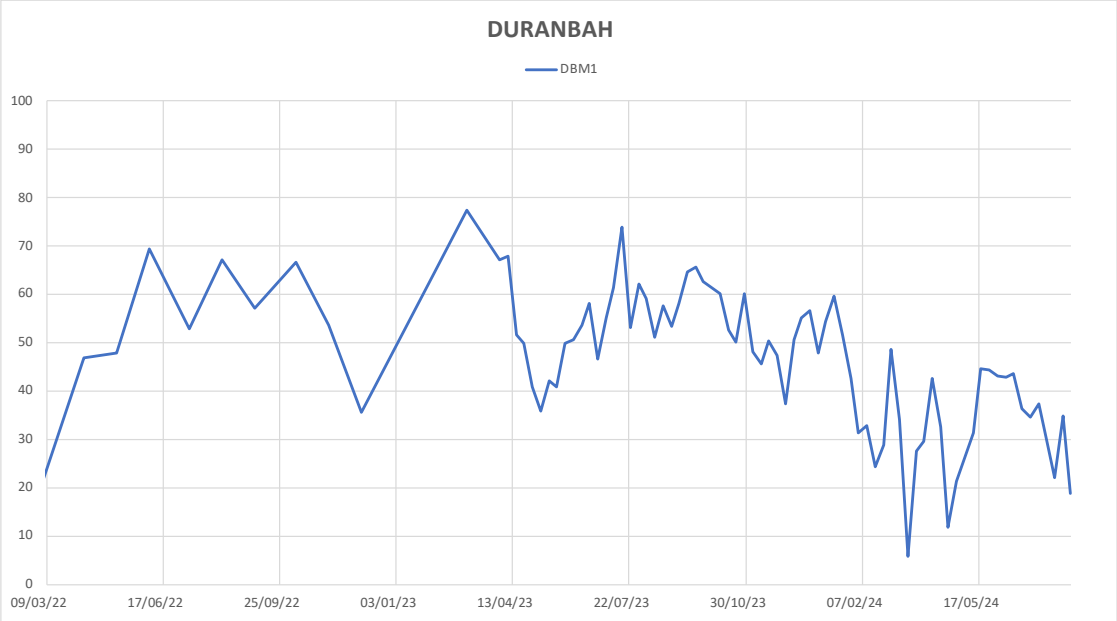
		feasibility studies into potential operational enhancements.	

Appendix B

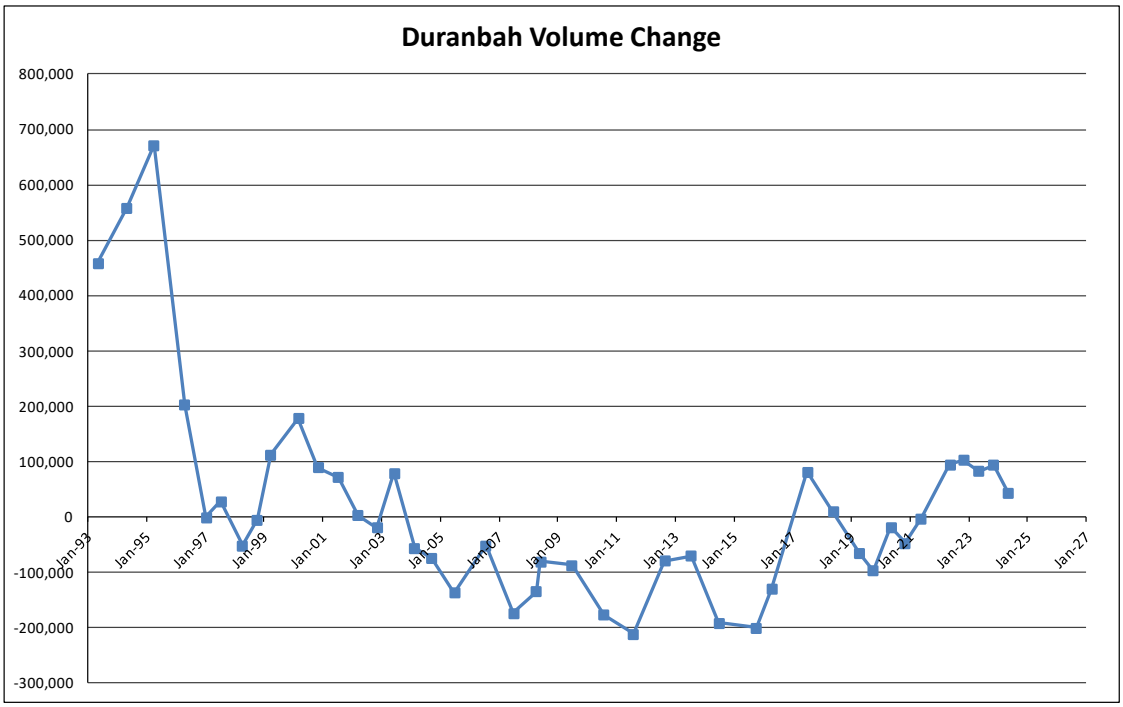
Beach Width and Compartment Volume Analysis

DURANBAH

Beach width (in metres)

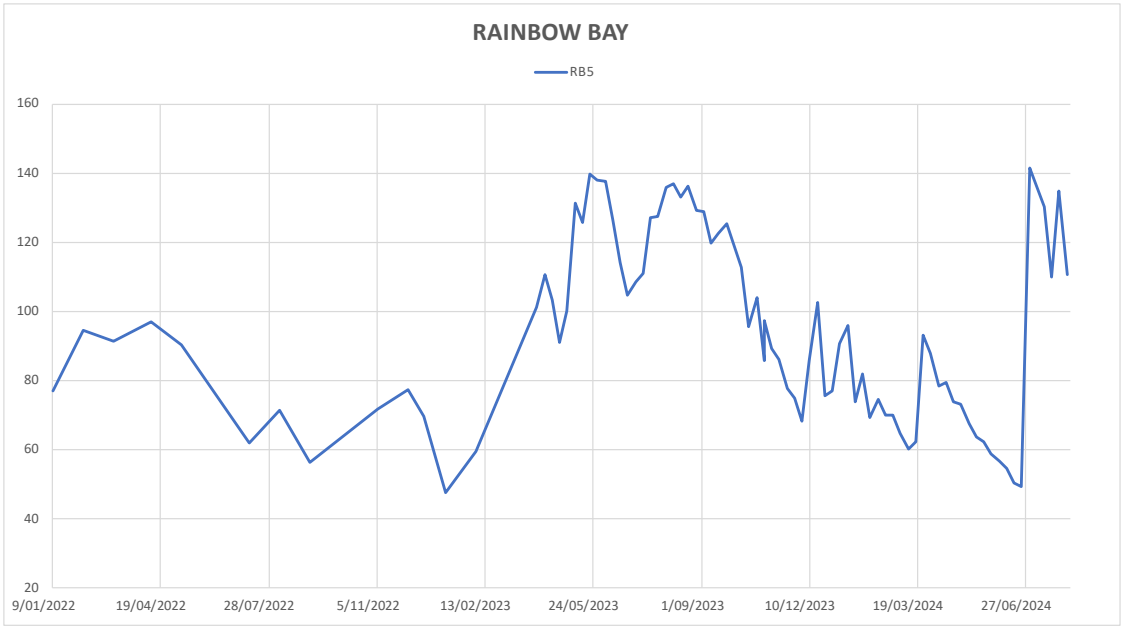


Compartment Volume (in cubic metres)

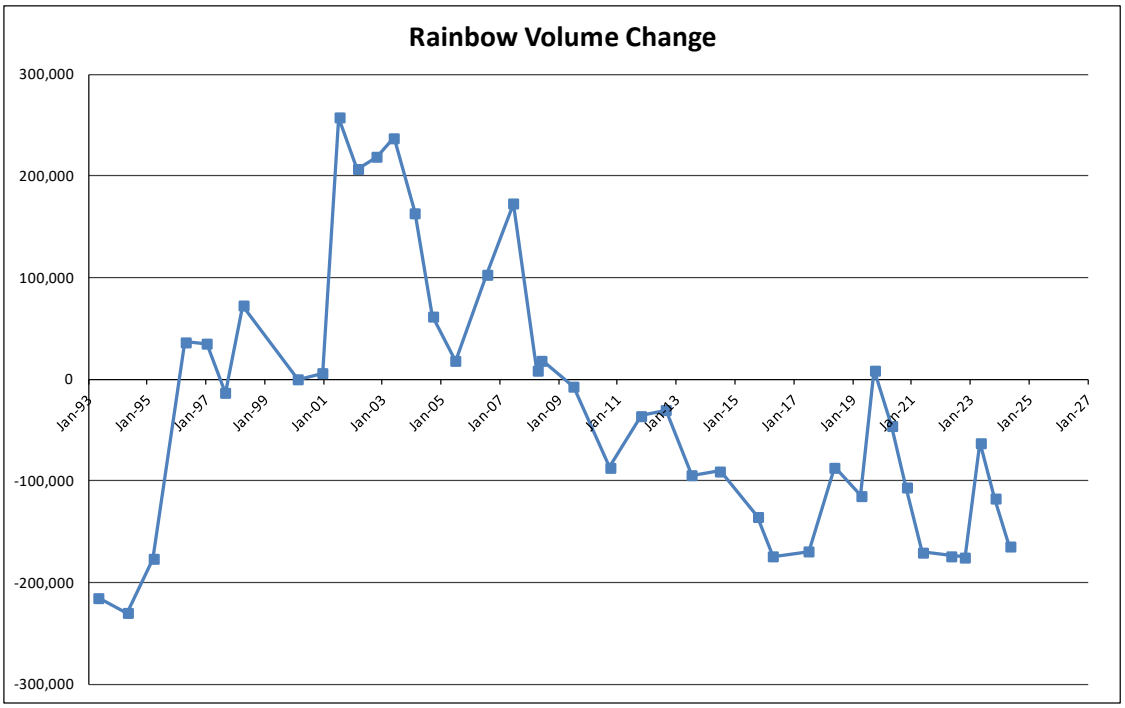


RAINBOW BAY

Beach width (in metres)

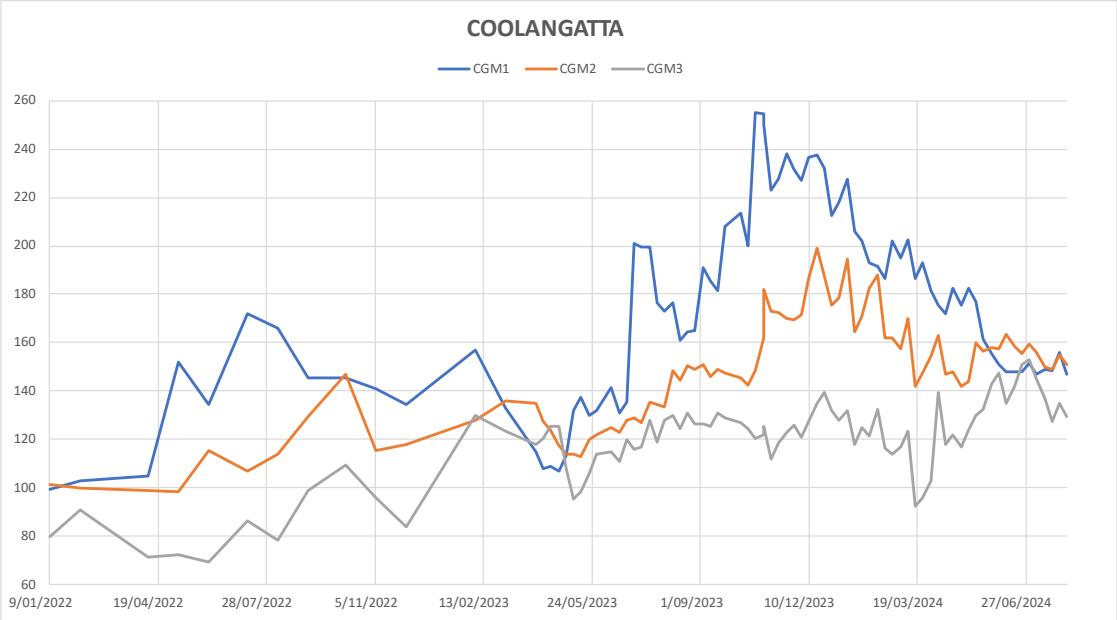


Compartment Volume (in cubic metres)

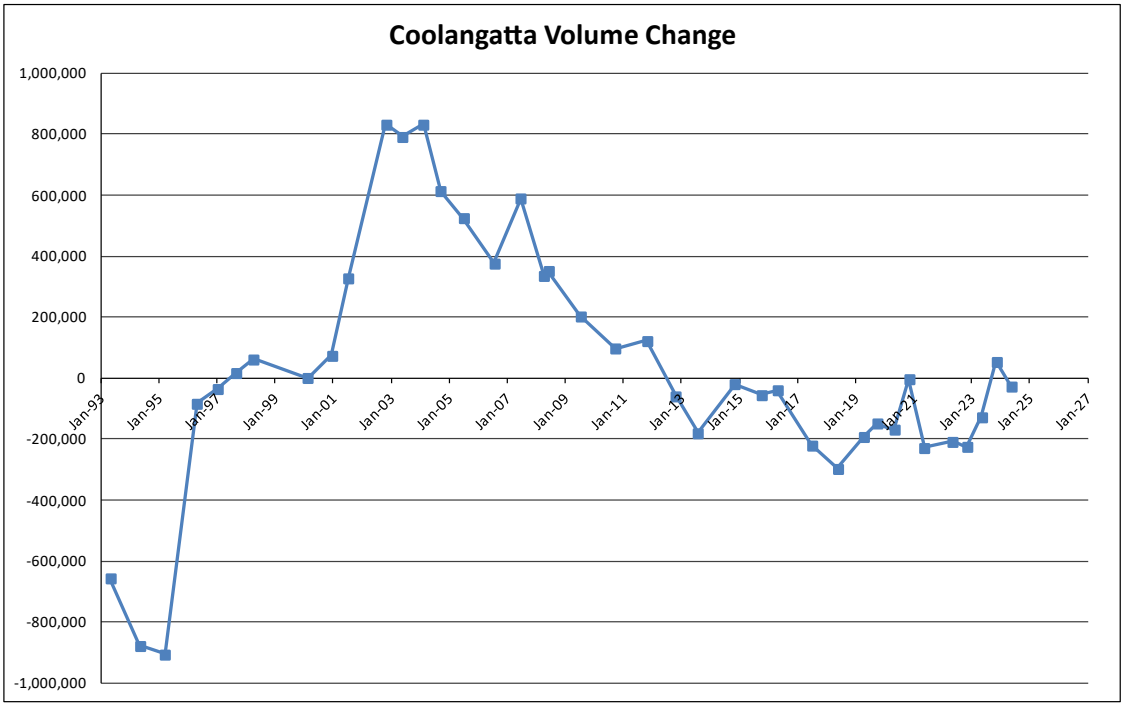


COOLANGATTA

Beach width (in metres)

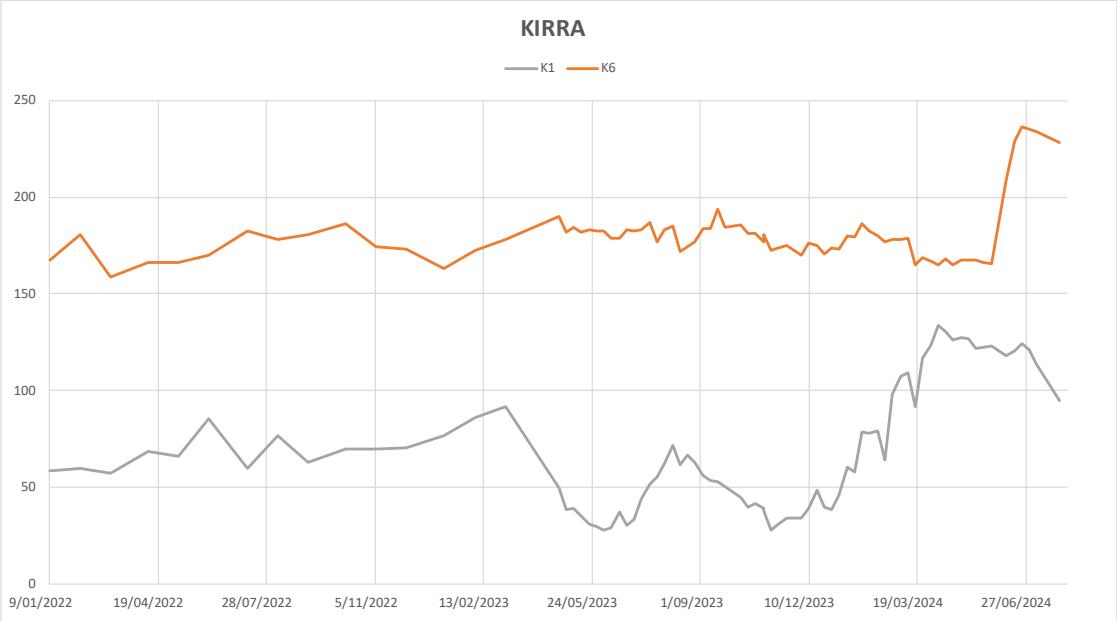


Compartment Volume (in cubic metres)

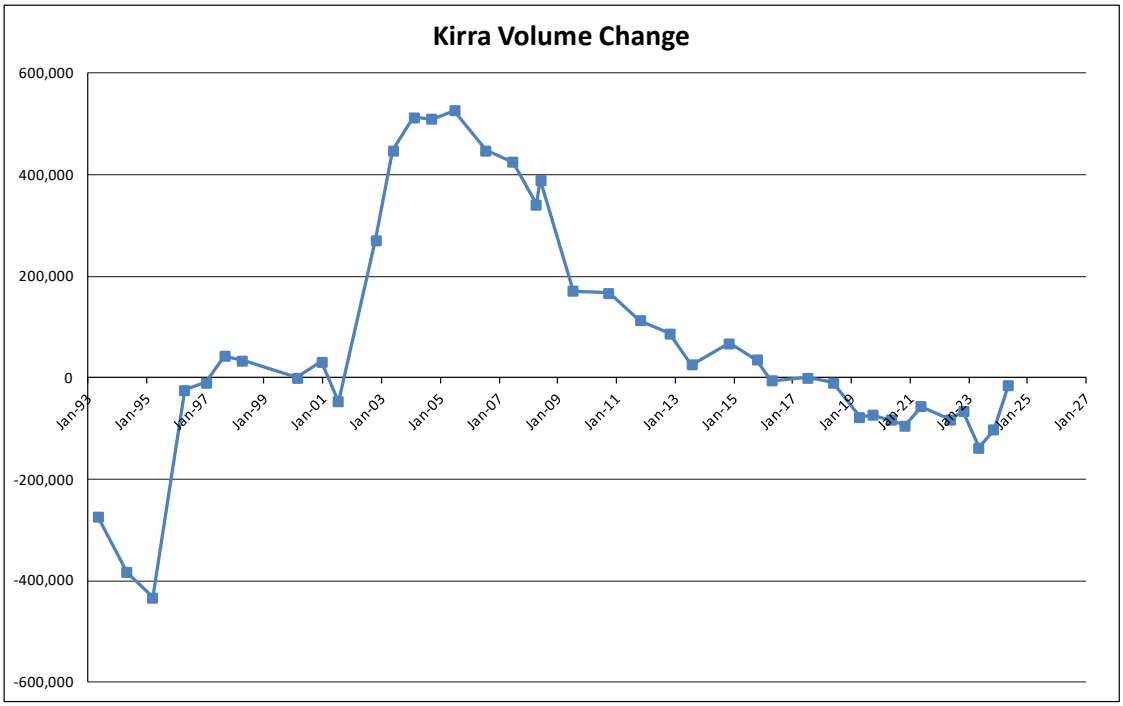


KIRRA

Beach width (in metres)

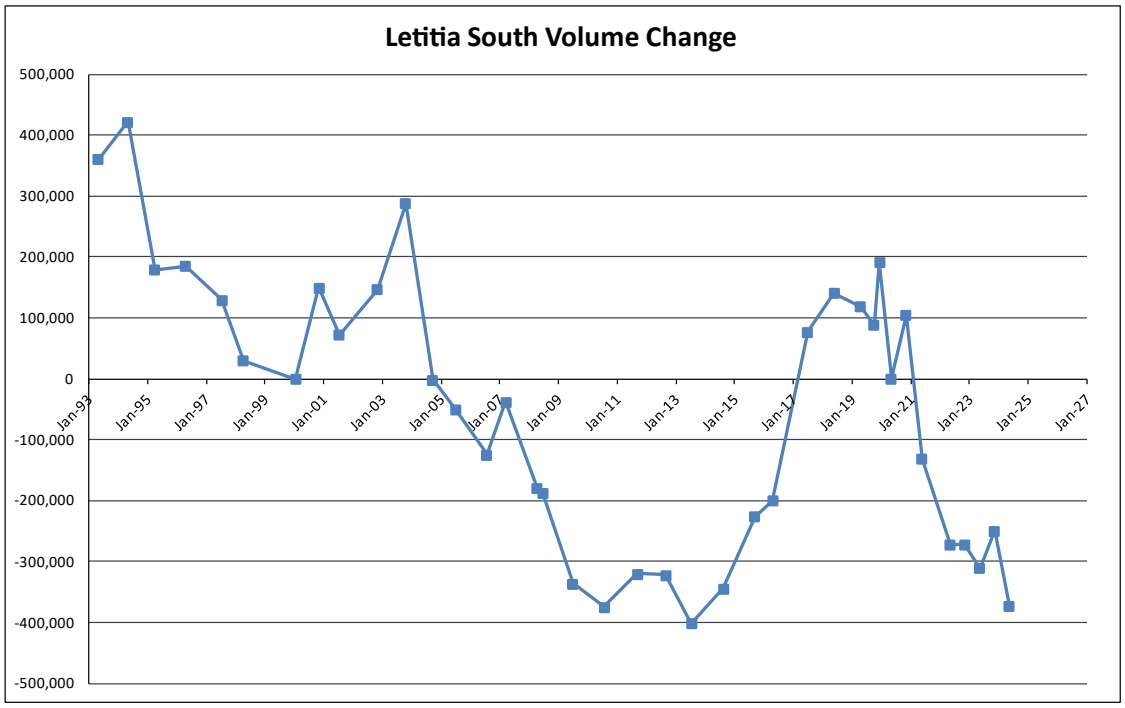


Compartment Volume (in cubic metres)

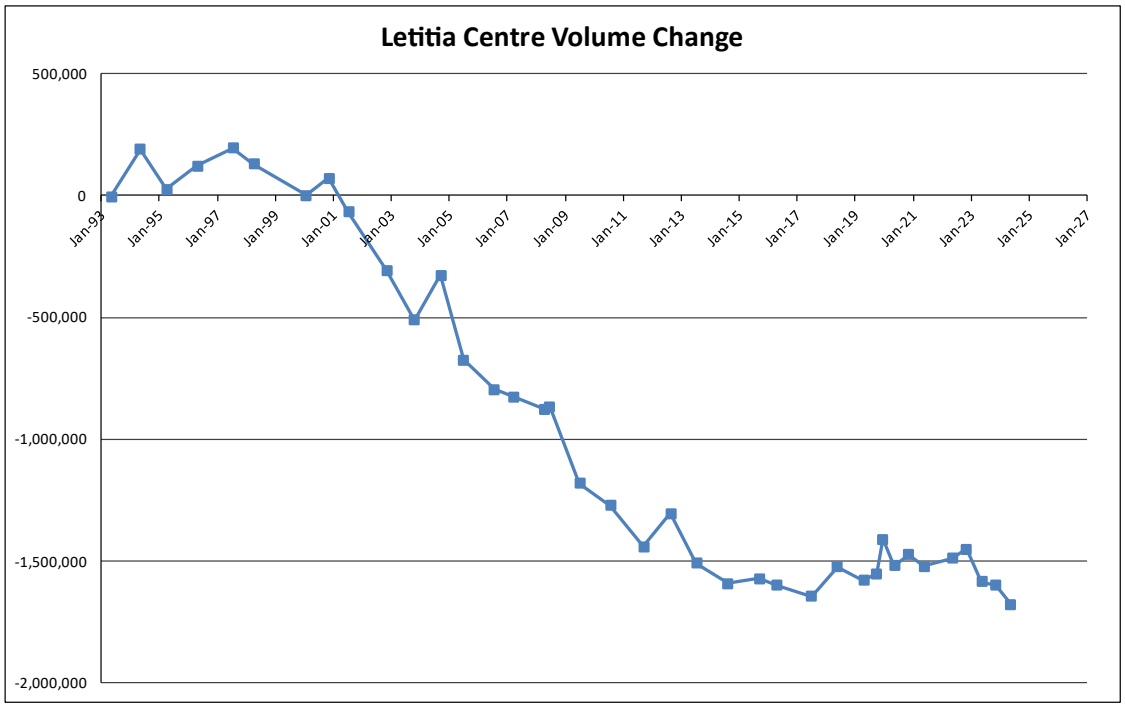


LETITIA

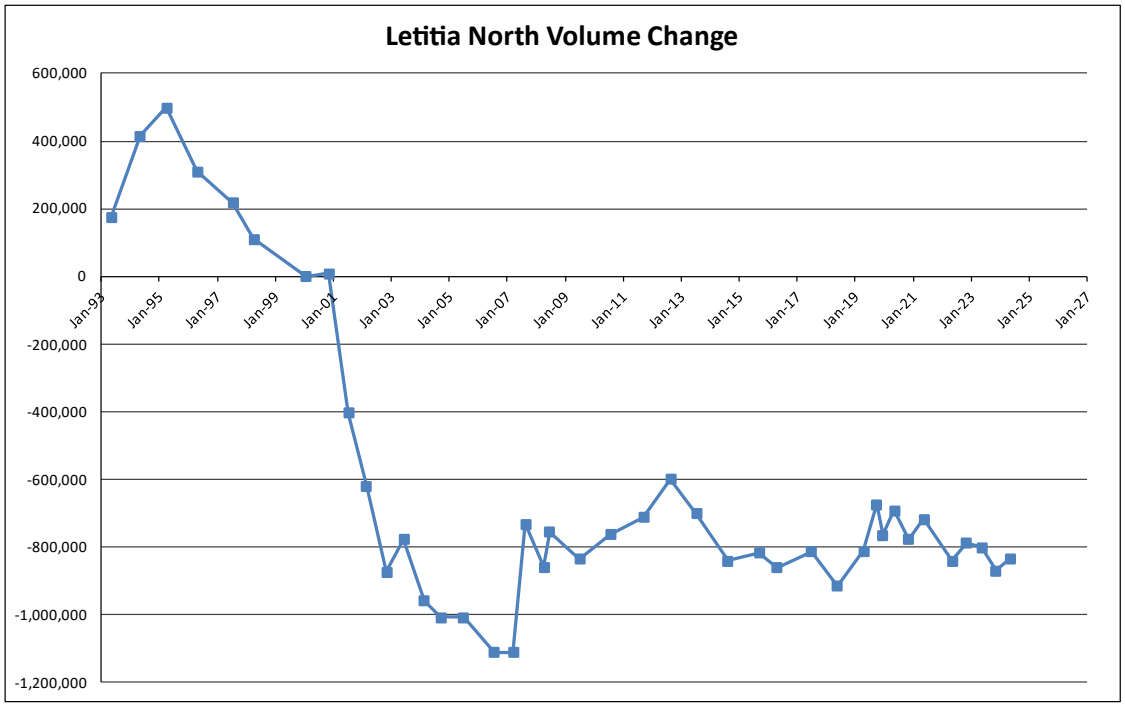
Compartment volume (South) (in cubic metres)



Compartment Volume (Centre) (in cubic metres)



Compartment Volume (North) (in cubic metres)



ADDITIONAL INFORMATION

Further information on beach width monitoring can be found on the website.

Tweed Sand Bypassing - Beach width monitoring (nsw.gov.au)

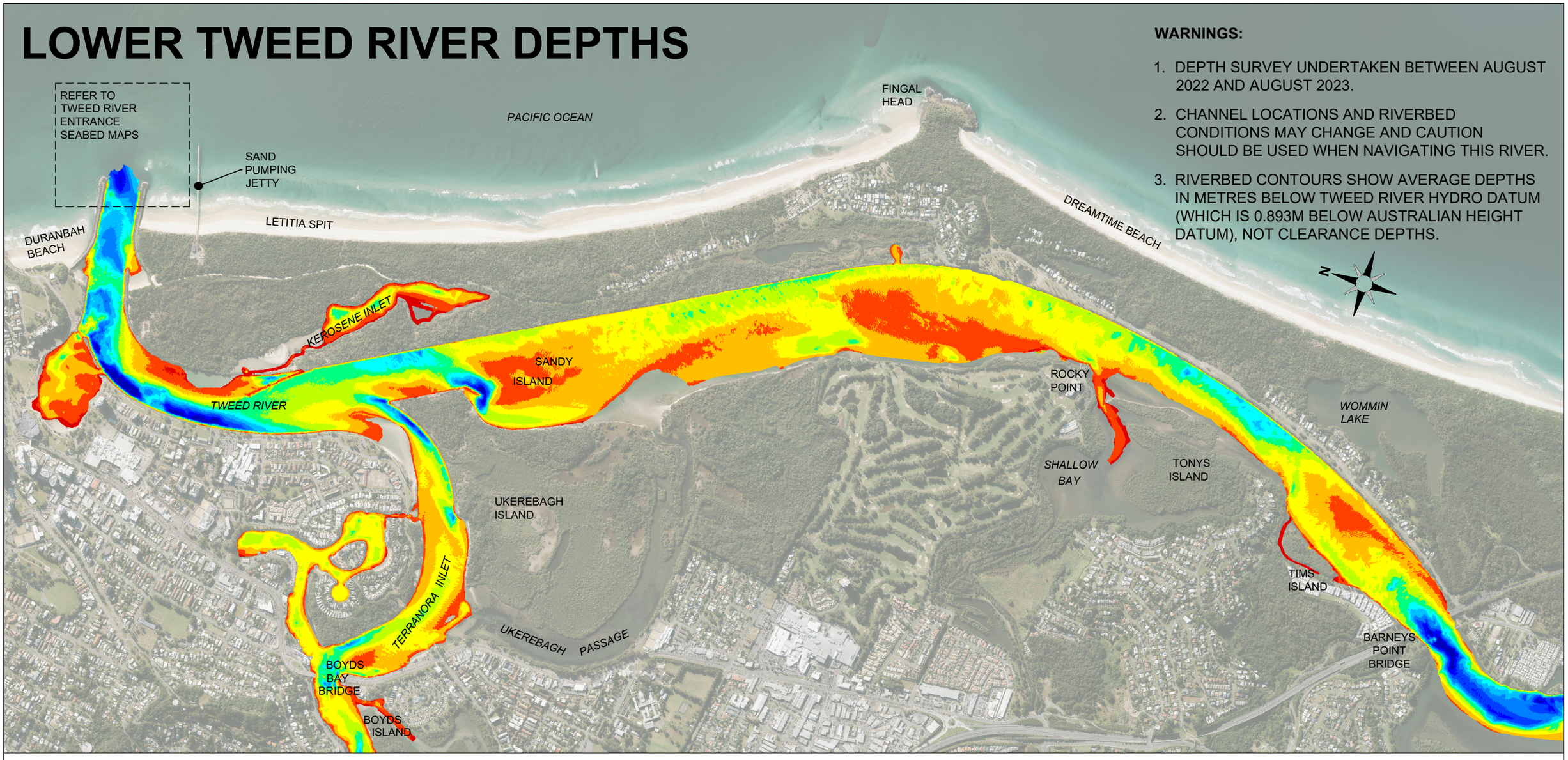
Appendix C

Survey

Hydrographic Survey Register

Survey Name	Survey Type	Start Date	No of Days	End Date	Delivery Date	Days to Delivery
Kirra Reef Survey	Kirra reef (grid)	03-May-23	2	04-May-23	10-May-23	6
Pre-dredge entrance only	Pre-dredge	03-May-23	2	04-May-23	10-May-23	6
Full Coastal Survey	full coastal	25-May-23	9	02-Jun-23	15-Jun-23	13
Additional Entrance Survey	AES	26-Jun-23	1	26-Jun-23	06-Jul-23	10
Post-dredge survey (2A)	Post-dredge	27-Jun-23	1	27-Jun-23	06-Jul-23	9
Tweed Quarterly (TRESBCo)	Quarterly	31-Jul-23	2	01-Aug-23	10-Aug-23	9
Control Volume, CVS & DVS	Control Volume	31-Jul-23	2	01-Aug-23	10-Aug-23	9
Interim Bilinga survey	Post-dredge	15-Aug-23	1	15-Aug-23	24-Aug-23	9
Pre-dredge survey (Ent, Fin, 2A, SRE, DBH)	Pre-dredge	30-Aug-23	2	31-Aug-23	11-Sep-23	11
Post-dredge survey (2A, SRE, DBH, DT)	Post-dredge	10-Oct-23	2	11-Oct-23	21-Nov-23	41
Tweed Quarterly (TRESBCo)	Quarterly	10-Oct-23	24	02-Nov-23	21-Nov-23	19
Control Volume, CVS & DVS	Control Volume	03-Nov-23	4	06-Nov-23	21-Nov-23	15
Full Coastal Survey	full coastal	27-Nov-23	12	08-Dec-23	20-Dec-23	12
Tweed Quarterly (TRESBCo)	Quarterly	09-Jan-24	3	11-Jan-24	19-Jan-24	8
Control Volume, CVS & DVS	Control Volume	09-Jan-24	3	11-Jan-24	19-Jan-24	8
Additional Entrance Survey	AES	29-Feb-24	1	29-Feb-24	13-Mar-24	13
Dbah Upper Beach Survey	Dbah	29-Feb-24	1	29-Feb-24	13-Mar-24	13
Interim Bilinga survey	Post-dredge	29-Feb-24	1	29-Feb-24	13-Mar-24	13
Tweed Quarterly (TRESBCo)	Quarterly	02-Apr-24	1	02-Apr-24	30-Apr-24	28

LOWER TWEED RIVER DEPTHS



WARNINGS:

1. DEPTH SURVEY UNDERTAKEN BETWEEN AUGUST 2022 AND AUGUST 2023.
2. CHANNEL LOCATIONS AND RIVERBED CONDITIONS MAY CHANGE AND CAUTION SHOULD BE USED WHEN NAVIGATING THIS RIVER.
3. RIVERBED CONTOURS SHOW AVERAGE DEPTHS IN METRES BELOW TWEED RIVER HYDRO DATUM (WHICH IS 0.893M BELOW AUSTRALIAN HEIGHT DATUM), NOT CLEARANCE DEPTHS.

TWEED SAND BYPASSING:

TWEED SAND BYPASSING IS A JOINT PROJECT OF THE NEW SOUTH WALES AND QUEENSLAND GOVERNMENTS, WITH THE SUPPORT OF THE CITY OF GOLD COAST, AND IN CONJUNCTION WITH THE TWEED SHIRE COUNCIL.

KEY:

INDICATIVE DEPTH IN METRES
(REFER TO WARNING NOTES)

< 0	3 TO 4	7 TO 8
0 TO 1	4 TO 5	8 TO 9
1 TO 2	5 TO 6	9 TO 10
2 TO 3	6 TO 7	> 10

NOTES:

1. SURVEYS ARE UNDERTAKEN TO MONITOR CHANGES IN THE LOWER RIVER SHOALS AS PART OF TWEED SAND BYPASSING'S ENVIRONMENTAL MONITORING PROGRAM.
2. TWEED RIVER ENTRANCE CONDITIONS ARE PROVIDED SEPARATELY ON THE TWEED RIVER ENTRANCE SEABED MAP.
3. SURVEY INFORMATION COLLECTED AS PART OF THE NORTHERN RIVERS RESILIENCE INITIATIVE.

REVISION

DATE	REV	DESCRIPTION	DRAWN	CHK
2024-07-18	REV0	INITIAL ISSUE	MH	MH

SCALES

0 500 1000
Metres

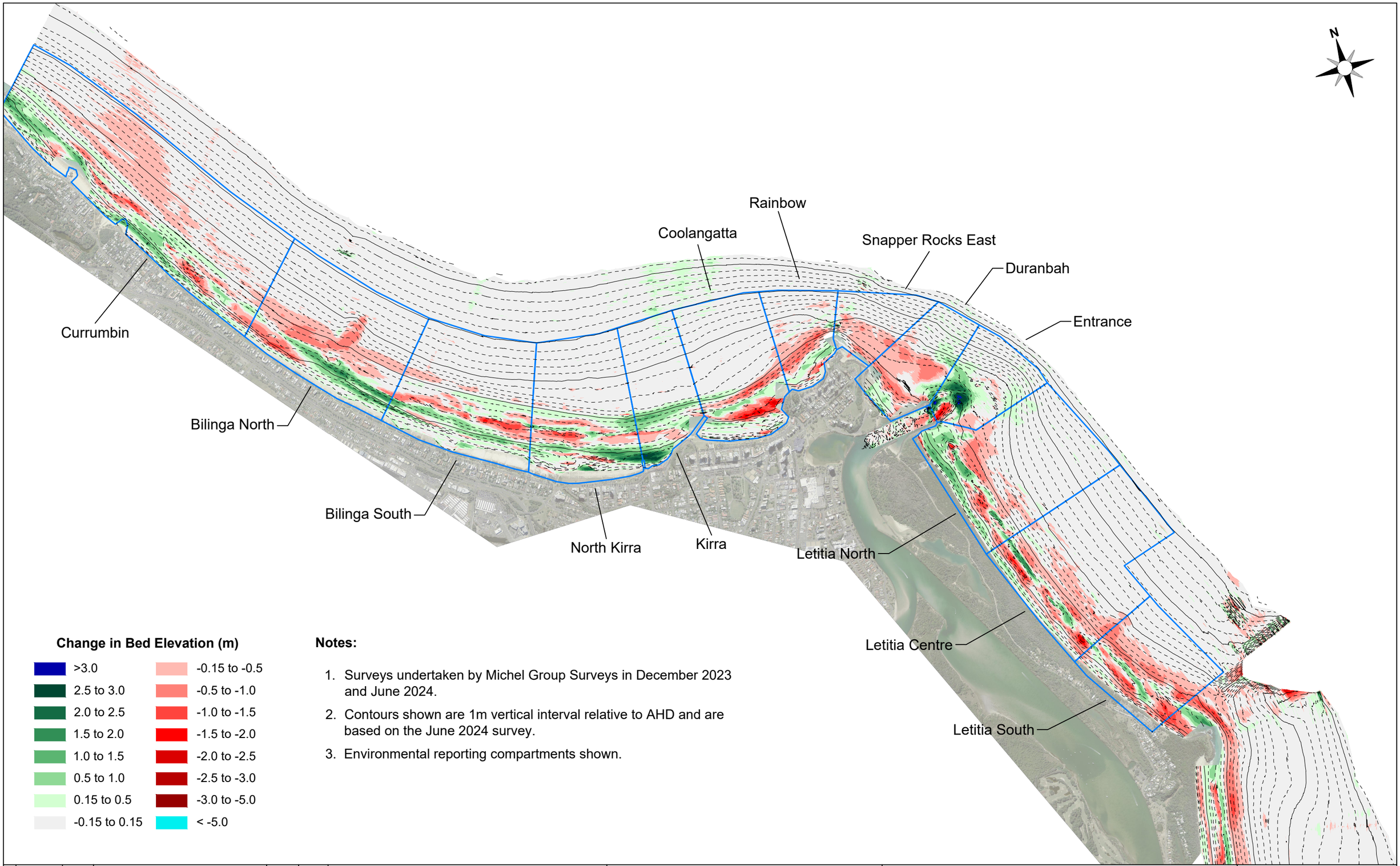
TWEEDSAND BYPASSING

LOWER TWEED RIVER
ESTUARY BATHYMETRY
AUGUST 2022 - AUGUST 2023

DRAWING NUMBER
SUP-DWG-9004

DRAWING PRODUCED BY:
HYDROSPHERE CONSULTING
WWW.HYDROSPHERE.COM.AU

T:\Drawings\River\SUP-DWG-9004 River bathymetry August 2022 CSIRO.dwg



Change in Bed Elevation (m)

>3.0	-0.15 to -0.5
2.5 to 3.0	-0.5 to -1.0
2.0 to 2.5	-1.0 to -1.5
1.5 to 2.0	-1.5 to -2.0
1.0 to 1.5	-2.0 to -2.5
0.5 to 1.0	-2.5 to -3.0
0.15 to 0.5	-3.0 to -5.0
-0.15 to 0.15	< -5.0

Notes:

1. Surveys undertaken by Michel Group Surveys in December 2023 and June 2024.
2. Contours shown are 1m vertical interval relative to AHD and are based on the June 2024 survey.
3. Environmental reporting compartments shown.

REVISION

DATE	REV	DESCRIPTION	DRAWN	CHK
2024-06-24	REV0	ORIGINAL	MH	MH

SCALES

0 1 2

Kilometres

TWEEDSAND BYPASSING

FULL COASTAL SURVEY

ISOPACH

DECEMBER 2023 TO JUNE 2024

DRAWING NUMBER

SUP-DWG-7009

DRAWING PRODUCED BY:
HYDROSPHERE CONSULTING
WWW.HYDROSPHERE.COM.AU

T:\Drawings\Coastal Survey\SUP-DWG-7009 Coastal ISO 2023-12 to 2024-06.dwg

Appendix D

EP&A Act Approval (NSW) Compliance

	Non-compliance.
	Issues with satisfying condition; or compliance with condition dependent on other assessment contained in this report.
	Condition satisfied.
	Not applicable *i.e. condition may be relevant to earlier stages of project* or *not triggered during this period.*

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
1	General The proposal shall be carried out in accordance with: • the proposal contained in the TRESBP Permanent System EIS subject to any modifications to the proposal as described in the TRESBP System Representations Report. • all identified procedures, safeguards and mitigation measures identified in the EIS and Representations Report subject to the conditions of approval granted by the Minister.	Refer to findings of this annual report for overall compliance status in relation to project.
2	General For the purposes of this approval, the date of commencement shall be from the date that the proponent determines to proceed with the proposal. The proponent shall provide the Director-General with the date of commencement within 14 days of the proponent determining to proceed with the proposal.	**Not applicable.** Condition relates to earlier stages of project.
3	Compliance It shall be the ultimate responsibility of the proponent to ensure compliance with all conditions of approval granted by the Minister.	Refer to findings of this annual report for overall compliance status in relation to project.
4	Compliance The proponent shall comply or ensure compliance with all requirements of the Director-General in respect of the implementation of any measures arising from the conditions of this approval. The proponent shall bring to the attention of the Director-General any matter that may require further investigation and issuing of instructions from the Director-General. The proponent shall ensure that these instructions are implemented to the satisfaction of the Director-General within such time that the Director-General may specify.	This annual report is provided to the Department of Planning, Industry and Environment. Any feedback from the Department will be responded to and/ or actioned appropriately.
5	Compliance	**Not applicable.**

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
	The proponent must submit for the approval of the Director-General a compliance report concerning the implementation of all conditions of this approval. The compliance report must be submitted within three months of completion of construction, or as otherwise agreed by the Director-General.	Condition relates to earlier stages of project.
6	Dispute Resolution The proponent shall endeavour as far as possible to resolve any dispute with relevant public authorities arising out of the implementation of these conditions of approval. Should this not be possible, the matter shall be referred to the Minister for resolution. The Minister's determination of the disagreement shall be final and binding on all parties.	**Not applicable.** There were no known disputes with relevant public authorities requiring resolution during this reporting period.
7	Consultation Requirements Following the selection of a preferred option, the proponent shall develop a Consultation Strategy to the satisfaction of the Director-General. This Strategy shall be submitted to the Director-General two months before the commencement of construction.	**Not applicable.** Condition relates to earlier stages of project.
8	Community Information The proponent shall ensure that the local community is kept informed of progress of the project by way of local newsletters, leaflets, newspaper advertisements and community notice boards as appropriate.	Refer section 6.0 Community engagement and complaints.
9	Complaints The proponent shall record details of all complaints received in an up to date log book and ensure that an initial acknowledgement is provided to the complainant within 24 hours and a detailed response within 10 days. Information on complaints received shall be made available on request of the Advisory Committee, all relevant government agencies, Tweed Shire Council, Gold Coast City Council and a summary included in Environmental Monitoring Reports. The proponent shall nominate an appropriately qualified person with the responsibility to receive, log, track and respond to complaints within the specified timeframe.	Refer section 6.0 Community engagement and complaints.
10	Environmental Management System The proponent shall ensure the appointment of contractors that have: • A demonstrated capability and experience in the implementation of an EMS prepared in accordance with the AS/NZS ISO 14000 series or BS 7750-1994 and certified by an accredited certifier; and/or • A proven track record in environmental management of projects of a similar nature.	Any actions in relation to construction not applicable for this reporting period, as construction was completed in earlier stages of project. In relation to operational activities, Governments have engaged Operator under a Concession Agreement with specific environmental requirements.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
		Currently the Operator has a Project Environmental Manager responsible for the EMS (EMP-Operations and TRESBCo sub-plans) under the ISO14001 certification.
11	Environmental Management Representative A suitably qualified Environmental Management Representative shall be available during construction activity at the site and be present on site during any critical construction activities as defined in the EMP for the construction stage works.	**Not applicable.** Condition relates to earlier stages of project.
12	Environmental Management Plans The proponent shall ensure the preparation and implementation of project specific Environmental Management Plans for the construction and operation stages of the work. The EMPs shall: • For all construction activities, be prepared and submitted to the Director-General for approval at least one month period to the commencement of construction work on site in accordance with the conditions of this approval, the EIS and Representations Report, all relevant Acts and Regulations and accepted best practice management plans. • For operational activities be prepared and submitted to the Director-General for approval at least one month prior to the commencement of operation of the system in accordance with the conditions of this approval, the EIS and Representations Report, all relevant Acts and Regulations and accepted best practice management plans. • Be updated as required and when requested by the Director-General. Any significant changes to the EMPs shall be referred to the Director-General for approval. • Be made publicly available and copies of the current version supplied to the Department of Planning, Tweed Shire Council, Gold Coast City Council and the Advisory Committee annually during the operation of the bypass system, or upon request.	EMPs prepared and submitted during earlier stages of project. Refer to section 3.3 – Figure 6 for list of current EMPs. The Independent Audit conducted in February 2024 noted a non-compliance for failure to review and provide timely response to directives from the Department in relation to EMP updates. TSB have been working with stakeholders and the Department throughout the monitoring period to appropriately update the EMP. Available to the public upon request.
13	Framework for EMPs The EMPs shall be prepared following consultation with relevant government agencies including EPA, NPWS, NSW Fisheries, the Advisory Committee, Tweed Shire Council and Gold Coast City Council.	**Not applicable.** Completed during earlier stages of project.
14	Framework for EMPs	**Not applicable.** Completed during earlier stages of project.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
	The EMPs shall include strategies for key environmental elements. The strategies shall be relevant to both the construction and operation stages of the project.	
15	Environmental Monitoring Reports The proponent shall submit three (3) monthly reports to the Director-General and the EPA on the results of monitoring commencing after the date of actual commencement of construction works at the site until the completion of construction and six (6) monthly during bypass operation for the first two years and annually after that or at any other period as determined by the Director-General. Reports shall include, but not be limited to, information on the following: • any applications for consents, licences and approvals, and responses from relevant authorities during the reporting period; • implementation and effectiveness of environmental controls and conditions relating to work undertaken; • identification of impact predictions made in the EIS and other supplementary studies and details of the extent to which actual impacts reflect the predictions; • details and analysis of environmental monitoring; • assessment of compliance with Environmental Management Plans for both construction and operation activities; • number and details of any complaints, including a summary of the main areas of complaint, action taken, response given and intended strategies to reduce complaints of a similar nature; and • any other matter relating to the compliance by the proponent with the conditions of this approval, or as requested by the Director-General of DUAP. Copies of these reports shall be submitted at the same time to the Director-General, EPA, NSW Fisheries, NPWS and the Advisory Committee and be made available to the public on request.	Submission of this annual report is intended to satisfy this condition. Copies of the report will be supplied to all relevant parties as per condition. Note: The independent audit identified a non-compliance for previous monitoring periods within the 5-year audit period where evidence could not be supplied of timely provision of the annual report to all stakeholders. All annual reports for this audit period have since been supplied to all relevant stakeholders.
16	Environmental Audits Environmental audit reports shall be submitted to the Director-General, the EPA and any other relevant authority: • at the completion of construction • annually for the first two years of operation • at five year periods thereafter during operation • at any other period required by the Director	Auditor Approved by the Department on 4 December 2023. Audit was undertaken in February 2024. See section 7.1 Independent Audit.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
	The audits shall be carried out by an independent person agreed to by the Director-General at the proponent's expense and shall assess the impacts relating to the proposal and the adequacy of safeguards and mitigation measures. The audits shall review all impact predictions made in the EIS and supplementary studies and detail the extent to which the actual impacts reflect the predictions. The compliance of the proponent with these conditions of approval including the implementation of the Environmental Management Plan shall also be assessed. Results of the consultation with the community and other relevant stakeholders shall also be included. The proponent shall comply with all reasonable requirements of the Director-General, the EPA or any other relevant authority with respect to the measures arising from, or recommendations by, the audits.	
17	<u>Environmental Monitoring Requirements</u> As part of the Environmental Management Plan referred to in Conditions 12 and 14, a detailed environmental monitoring program for the construction and operation stages of the works shall be developed. The monitoring program shall be based on the commitments contained in Table 8.5.1 of the EIS and shall include, but not be limited, monitoring of the following parameters: • Duranbah surf quality and beach amenity; • Tweed River Entrance bathymetric conditions; • Wetland distribution and health determined through the use of aerial photography and periodic quadrat sampling if required; • Beach morphology and encroachment into currently stabilised dunal areas at Letitia Spit; • Training wall stability; and, • Condition of Lower Estuary Marine Shoals and compliance with Lower Estuary Marine Shoals Management Plan.	Monitoring program developed during early stages of project, and is reviewed annually as part of budget planning/ review. Refer section 4.1 for monitoring undertaken during this period and section 5.0 for monitoring outcomes.
18	<u>Conditions of Contract</u> All conditions of Contract imposed by the proponent shall also form part of this condition of approval. Where there is an inconsistency between the conditions of contract and these conditions of approval, the conditions of approval will apply.	Contractor compliance with contract monitored ongoing.
19	<u>Notification of Selected Bypass System</u> Following selection of a bypass system and prior to commencement of construction, the proponent shall notify the Director-General of the bypass system and shall demonstrate to the satisfaction of the Director-General that the selected system is within the parameters of these conditions of approval. This notification shall be provided within one month of selection of the preferred system.	**Not applicable.** Condition relates to earlier stages of project.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
20	Notification of Change of Bypass System Six months prior to decommissioning of an existing bypassing system, the proponent shall notify the Director-General of the new system to be implemented and demonstrate to the satisfaction of the Director-General that it is within the parameters of these conditions of approval.	**Not applicable.** Not required during this monitoring period.
21	Traffic & Access As part of the EMPs referred to in Conditions 12 and 14, the proponent shall ensure that a Traffic Management Strategy is prepared for the construction and operation stages of the works. The Strategy shall be prepared in consultation with Tweed Shire Council.	Sub-plan B5 Traffic and Air Quality Management Plan managed by TRESBCo has been approved to meet to this condition. Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.
22	Landscaping & Visual The proponent shall ensure that all on-site lighting is screened or directed away from residences.	Completed in earlier stages of project.
23	Landscaping & Visual The proponent shall ensure that all structures are of material and colours which are sympathetic to the surrounding environment.	Sub-plan B10 Landscaping Management Plan managed by TRESBCo has been approved to meet to this condition. Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.
24	Landscaping & Visual Permanent pipelines shall be buried where possible and shall be painted an appropriate colour to minimise visual intrusion where burial is not possible.	
25	Landscaping & Visual The proponent shall prepare a landscaping plan for disturbed areas which shall incorporate the use of native species. The plan shall be prepared in consultation with Tweed Shire Council.	
26	Noise & Vibration Management As part of the EMPs referred to in Conditions 12 and 14, the proponent shall prepare in consultation with the EPA, a detailed Noise and Vibration Management Strategy. The Strategy shall provide details of noise and vibration	Sub-plan B4 Noise and Vibration Management Plan managed by TRESBCo has been approved to meet to this condition.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
	control measures to be undertaken during construction and operation and shall reference environmental issues and goals set out in the relevant EPA guidelines.	Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.
27	Noise & Vibration Management All construction activities (with the following exception) including entry and departure of heavy vehicles shall be restricted to the hours 7am to 6pm Mondays to Fridays, and 8am to 1pm Saturdays and Sundays with no work to be undertaken on Sundays and Public Holidays. Works outside these hours which may be permitted include: • Any works which do not cause noise emissions to be audible at any nearby residential property; • The delivery of materials which is required outside these hours requested by NSW Police or other authorities for safety reasons; • Emergency work to avoid the loss of lives/property or damage to the environment; and, • Any other works as approved by the EPA.	**Not applicable.** Construction works not undertaken during the reporting period, other than the construction of a new pit at Duranbah beach which was managed in accordance with requirements of the Review of Environmental Factors report inclusive of Noise management controls.
28	Historic Shipwreck Management Strategy As part of the EMPs referred to in Conditions 12 and 14, the proponent shall ensure a Historic Shipwreck Management Strategy is prepared by a suitably qualified specialist in consultation with the NSW Heritage Office.	Sub-plan B11 Historic Shipwreck Management Plan managed by TRESBCo has been approved to meet to this condition. Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.
29	Air Quality The proponent shall: • Undertake dust suppression measures, including use of water trucks, water spraying of activity areas and roads, covering or protecting stockpile sites, ensuring all trucks leaving the site are covered and undertaking revegetation of disturbed areas.	Sub-plan B5 Traffic and Air Quality Management Plan managed by TRESBCo has been approved to meet to this condition.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
		Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.
30	Soil & Water Management Prior to commencement of construction, an assessment of the potential for disturbance of acid sulphate soils or potential acid sulphate soils shall be undertaken along the pipeline routes and other relevant areas in accordance with 'Acid Sulphate Soils – Assessment and Management Guidelines (Draft)' (ASSMAC, 1997). If required a management plan shall be prepared to the satisfaction of the EPA.	**Not applicable.** Condition relates to earlier stages of project.
31	Soil & Water Management As part of the EMPs referred to in Conditions 12 and 14, the proponent shall prepare a Water Quality Management Strategy which outlines the proposed mitigation measures to be implemented during construction and operation stages of the works. The strategy shall contain procedures to be implemented in case of accidental spillage.	Sub-plan B6 Sand and Water Quality Management Plan managed by TRESBCo has been approved to meet to this condition. Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.
32	Waste Management As part of the EMPs referred to in Conditions 12 and 14, the proponent shall prepare a Waste Management Strategy that details how waste material will be managed to ensure reuse, reprocessing or recycling is maximised and how any remaining waste will be disposed of. This condition applies to all stages of the project, including decommissioning of the bypass system.	Sub-plan B8 Waste Management Plan managed by TRESBCo has been approved to meet to this condition. Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
33	Utilities & Services The proponent shall ensure the diversion, protection or support of services and utilities affected by the construction activities, in consultation with the relevant service authorities. Any alterations to utilities and services shall be carried out to the satisfaction of the relevant authority(s) and, unless otherwise agreed to, at no cost to the service authority.	**Not applicable.** Condition relates to earlier stages of project.
34	Utilities & Services The proponent shall be responsible for minimising any disruption to services resulting from such work and shall be responsible for advising affected people prior to disruption to services.	**Not applicable.** Condition relates to earlier stages of project.
35	Indigenous Heritage All construction activities shall be undertaken in a manner which avoids disturbance to the following areas as identified in Figures 3 and 5 in 'A Cultural Heritage Assessment of the Terrain to be Impacted by the Proposed Tweed River Entrance Sand Bypassing Project' (Davies, 1997): • Soak on Letitia Spit; • Unquarried portion of rock at Point Danger; and, • Rocky knoll behind Duranbah Beach.	**Not applicable.** Condition relates to earlier stages of project.
36	Indigenous Heritage If any potential archaeological remains are identified during construction or operation activities, the proponent shall immediately contact NPWS, Tweed-Byron Local Aboriginal Corporation and the appropriate action shall be taken under the *National Parks and Wildlife Act, 1974*.	**Not applicable.** There were no known archaeological remains identified during this reporting period.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
37	Lower Estuary Shoals Management Plan The proponent shall consult with Tweed Shire Council and other relevant parties to develop a Lower Estuary Shoals Management Plan prior to the commencement of operation of the bypass system. The Plan, which must form part of the Tweed River Management Plan, shall include procedures and responsibilities for maintaining and protecting the Lower Estuary Shoals. The proponent's specific responsibilities in the Plan shall include maintenance of the shoals following major flood events.	Tweed Shire Council has implemented the *Tweed River Estuary Coastal Management Program 2022-2032* under the *Coastal Management Act 2016*. Tweed River Estuary: Coastal Management Program 2022 - 2032 (nsw.gov.au) It follows the five (5) stage process for preparing a CMP in accordance with the Coastal Management Manual and was done in consultation with DPE. As part of this program a review of the environmental monitoring data collected thus far through the *TRESBP Environmental Monitoring Program* has been programmed in consultation with Tweed Shire Council, TfNSW Maritime and TRESBP to determine future response to dredging and sand extraction activities. Sub-plan B16 Tweed River Entrance & Lower Estuary Management Plan managed by the Governments has been approved to meet this condition and includes actions for the management of Lower estuary shoals. Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
38	Sand Retrieval & Discharge Strategy Following selection of a preferred bypass system, the proponent shall prepare a Sand Retrieval and Placement Strategy.	Sub-plan B3 Sand Retrieval and Placement Strategy managed by TRESBCo has been approved to meet this condition. Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.
39	Flora & Fauna Management Prior to the commencement of construction works, the proponent shall prepare, to the satisfaction of the Director-General and in consultation with NPWS, a Flora and Fauna Management Strategy for the proposed works. The Strategy shall take into account, as advised by NPWS, any draft or final recovery plan for the Little Tern. When any such draft recovery plan is finalised, the proponent shall review and if necessary update the Flora and Fauna Management Strategy to implement any relevant recommendations of the recovery plan.	Sub-plans B9 Letitia Spit Avifauna Habitat Management Plan (managed by Governments) and B10 Landscaping Management Plan (managed by TRESBCo) have been approved to meet this condition. Refer to Appendix E for compliance with government sub-plan conditions. Refer to Appendix F for compliance with TRESBCo sub-plan conditions.
40	Flora and Fauna Management Construction and operation of any works associated with the bypass system that may affect South Head Beach area are not to be undertaken in conjunction with any works to be carried out at Tony's Bar including dredging works proposed in that location by Tweed Shire Council.	**Not applicable.** Not triggered during the reporting period.

COND NO.	APPROVAL CONDITION	COMPLIANCE STATUS MAY 2023 TO APRIL 2024
41	Flora & Fauna Management For those bypass systems defined as Category 3 systems in the 'Tweed Entrance Bypass Threatened Avifauna Assessment' (WBM Oceanics, 1997), namely those systems involving a fixed infrastructure with sand intakes located across the nearshore zone, with pump stations/headquarters located landward of the foredune, all infrastructure and any significant disturbance must be contained within 1000 m of the southern breakwater of the entrance of the Tweed River.	Construction related aspects of this condition completed in earlier stages of project. There was no significant disturbance noted in this area during this reporting period that may be attributed to the TSB operation.
42	Flora & Fauna Management For those bypass systems defined as Category 2 or Category 4 systems in the 'Tweed Entrance Bypass Threatened Avifauna Assessment' (WBM Oceanics, 1997), namely those systems involving mobile land based systems which extract sand from the beach, berm and immediate nearshore areas and which may include delivery pipes across or buried under the beach and dune, all infrastructure and any significant disturbance must be contained within 500m of the southern breakwater of the entrance of the Tweed River.	**Not applicable.** Category 2 or Category 4 system not selected as preferred option.

Appendix E

Evaluation EMP and Sub-Plans

	Non-compliance.
	Issues with satisfying condition; or compliance with condition dependent on other assessment contained in this report.
	Condition satisfied.
	Not applicable *i.e. condition may be relevant to earlier stages of project* or *not triggered during this period.*

Sub-plan B1: Consultation Strategy *(5 April 2007 Rev: 1)*

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2023 - APRIL 2024
1.1	Approval of the EMS–Operations.	EMS-Operations and sub-plans were approved in 2007. EMS-Operations were revised in 2021 in accordance with TRESBC certified environmental management system. This revision did not require department approval. EMP-Operations and sub-plans have been revised to align with the new operating model (TfNSW replacing TRESBCo as operator 1 October 2024). TSB have liaised with stakeholders and the department to achieve approval of the new OEMP and supporting plans. Approval given on 24 September 2024 (outside this monitoring period).
1.2	Registration of the consultation process.	**Compliant.** Formal consultations with administering authorities saved in TfNSW database, for example consultation for the EMP-Operations undertaken in April 2024. On-going consultation occurs with community representatives, Tweed Shire Council, City of Gold Coast and DETSI through quarterly Advisory Committee meetings.
1.3	Make the EMS-Operations publicly available.	**Compliant.** EMS-Operations is available to the public upon request, and copies were circulated to relevant authorities for

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2023 - APRIL 2024
		distribution to the public in early stages of the project.
1.4	Appointment of an Environmental Management Auditor for independent environmental audit.	**Compliant.** Auditor Approved by the Department on 4 December 2023. Audit was undertaken in February 2024. See section 7.1 Independent Audit.
1.5	Independent Environmental Audits.	**Compliant.** Audit was undertaken in February 2024. See section 7.1 Independent Audit.
1.6	Consult with the surfing community in relation to Beach Management and Nourishment Strategies.	**Compliant.** See section 6.0 Community engagement and complaints.
1.7	Satisfy the NSW and QLD statutory planning and development requirements, and to obtain licences, approvals and permits where required.	**Compliant.** No new project works were undertaken requiring approvals or licences during this reporting period.
1.8a	Be aware of the possible existence of sites that may have Aboriginal Cultural and Heritage Values and avoid any possible disturbance to the sites.	**Not triggered.** No known or reported impacts to Aboriginal and Heritage values were identified during the reporting period.
1.8b	Consult with NSW NPWS if any potential archaeological remains are identified in NSW during Operations and carry out the appropriate action under the NPWS Act 1974, Qld. EPA (now Department of Environment and Heritage Protection) if remains are found in Qld.	**Not triggered.** No known archaeological remains reported or identified during the reporting period.
1.9	Ensure that the relevant parties are consulted regarding Native Title issues.	**Not triggered.** No known or reported Native Title issues identified during the reporting period.
1.10	Consult with the relevant agencies on potential disruptions and public safety during dredging.	**Compliant.** Refer section 6.0 Community engagement and complaints. Maritime NSW

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2023 - APRIL 2024
		notified of proposed dredging works during reporting period. Marine notice published by NSW Maritime on Transport for NSW Maritime website. Point Danger Volunteer Marine Rescue, local Surf Life Saving Clubs and Maritime Safety QLD were notified via email of dredging campaign; and the community via TSB community meetings and social/ website platforms.
1.11	Inform the tourism industry of the possible disruption in accessing the beach areas during repairs and maintenance period.	**Compliant.** Refer section 6.0 Community engagement and complaints.
1.12	Minimise any impact on the fisheries, especially whiting and mullet.	**Compliant.** TSB operations undertaken in accordance with environmental management plans and project approvals to minimise any impacts to the environment including fisheries, for example community and key stakeholders informed of project activities, defined placement locations and sand quantity limits for pumping and dredging, environmental monitoring etc.
1.13	Regularly inform the local community and registered stakeholder groups of the progress of the project.	**Compliant.** Refer section 6.0 Community engagement and complaints.
1.14	Review the consultation requirement due to changes in legislation.	**Compliant.** Refer section 6.0 Community engagement and complaints.

Sub-plan B9: Letitia Spit Avifauna Management Strategy *(5 April 2007 Rev: 5)*

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
1.1	Review and update the monitoring program carried out during the construction and commissioning phase of the Stage 2 permanent sand bypassing system.	**Not applicable.** Action completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Letitia Spit Avifauna Management Plan approved by Department of Planning (previously Department of Urban Affairs and Planning) on 23 February 2001."
2.1	Before the start of operations of the sand bypassing system, undertake low level aerial photography along Letitia Spit to be used as a baseline to establish the pre-commissioning location of the shoreline.	**Not applicable.** Action completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Baseline aerial photographs were captured on 11 May 2000."
2.2	Carry out capture of aerial photography of the shoreline along Letitia Spit at regular intervals to detect any changes in the shoreline.	**Compliant.** See section 5.6 and Appendix A Supporting Information – Item 5 Aerial Photography. Aerial imagery captured periodically throughout the monitoring period.
2.3	Undertake tidal monitoring within the Lower Tweed River.	**Compliant.** Water level and tidal data is continuously recorded at station Letitia 2A by Manly Hydraulic Laboratory (NSW). See section 5.2 and Appendix A Supporting Information - Item 2 Tidal Analysis.
2.4	Review and analyse the tidal behaviour at Letitia 2A tide gauge and assess changes in tidal levels at Tony's Bar.	**Compliant.** Water level and tidal data reviewed and analysed by Manly Hydraulic Laboratory (NSW). See section 5.2 and Appendix A Supporting Information - Item 2 Tidal Analysis. No significant changes in water levels identified during this monitoring period.
2.5	Prepare tidal analysis report.	**Compliant.** Tidal analysis report prepared by MHL on behalf of the TSB. Appendix A

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		Supporting Information - Item 2 Tidal Analysis.
2.6	Develop and implement management measures in partnership with Tweed Shire Council (TSC) if the sand bypassing system causes impacts on the Little Tern due to significant tidal changes in the lower Tweed River estuary.	**Not triggered.** No significant tidal changes detected in tidal analysis.
2.7	Consult with NSW NPWS and Tweed Shire Council in the preparation of public education campaign informing users of South Head Beach areas of the importance as habitat for bird species.	**Not applicable.** Action completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Pamphlets have been distributed to NSW NPWS, QEPA, TSC, TBLALC, Fingal residents, TRESBC, other interested residents and tourism companies, bait shops, kiosk and caravan parks."
2.8	Preparation of public education campaign and placement and maintenance of the signage.	**Not applicable.** Action completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "3 signs have been erected at: Southern side of the southern entrance breakwater, Entry to TRESBC jetty compound and Entry to Fingal"
2.9	Liaise with TSC regarding the banning of dogs and 4WD on South Head Beach, particularly within the northernmost 500m of the beach.	**Not applicable.** Action completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "TSC has banned 4wd at South Head Beach except those belonging to licensed Mullet Fishermen (march 2001)."

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
2.10	Liaise with TSC and TBLALC to ensure that the Little Tern is considered in their proposed habitat enhancement work, if any.	**Not applicable.** Action completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Have consulted TSC. TSC has carried out little tern survey at six monthly interval for some years."
2.11	Engage an Ornithologist to observe if any nesting occurs and prepare a proposal for habitat enhancement works if appropriate.	**Compliant.** Ornithologist engaged during earlier stages of project (2009/2010 and 2013/2014 breeding seasons). No evidence of Little Tern nesting was found and there is no evidence from previous studies to prove Little Terns nested historically on South Head Beach. The 2009/2010 report notes that Little Terns use South Head Beach sporadically and that the beach provides some value as a migration stop over, however it was highly unlikely that Little Terns would attempt to nest on South Head beach due to the quality of habitat, lack of good shingle cover and impacts from recreational disturbance and construction of break wall. The 2013/2014 survey did not record/ observe any Little Terns, although two threatened species listed on the NSW Threatened Species Conservation Act 1995, and four migratory species listed on the Federal Environment Protection and Biodiversity Conservation Act 1999 were recorded. The report notes that habitat seemed to have stabilised since the 2009/2010 survey. The area of exposed sand north of the sand pumping jetty, noted also in 2009/10 survey, coupled with the sparsely vegetated fore dune, had some suitable breeding habitat attributes for little tern. However, the Ornithologist concluded that the area is highly disturbed and lacks the openness of most current little tern breeding sites; and that use of the area as a breeding

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		site by little tern is unlikely. There were no recommendations for habitat enhancement works in the 2009/2010 or 2013/2014 reports. The revised EMP-Operations, approved September 2024, has monitoring actions to establish a new baseline of shoreline habitat for shorebirds now that Letitia Spit has stabilised. This is to be complete by 2026.
2.12	Liaise with DECC and DoP regarding the result of the observation and the recommendation of the Ornithologist.	**Not triggered.** Not required during this period.
2.13	Liaise with DECC (formerly NSW NPWS) to determine the status of the Draft Little Tern Recovery Plan.	**Not applicable.** Confirmed during earlier stages of project, Little Tern Recovery Plan approved October 2003 and available on the NSW NPWS website.
2.14	Implement the recommendations of the Ornithologist taking into account the outcome of consultation with DECC, TSC, TBLALC and DoP.	**Not triggered.** Not required during this period.
2.15	Monitor the effectiveness of the habitat enhancement works if required.	**Not triggered.** No habitat enhancement works completed during period.
2.16	Should it not be viable to carry out habitat enhancement work at South Head Beach, after further assessing the beach's suitability and consulting with DECC, seek the Minister for Planning's Approval to modify Condition No. 39ii.	**Compliant.** Commenced consultation with administering authority in relation to modifying condition.
2.17	Document the process of all consultations.	**Compliant.** Formal consultations with administering authorities saved in TfNSW database, for example Review of Environmental Factors consultation, approval modification request etc

Sub-plan B13: Beach Management & Nourishment Strategy *(5 April 2007 Rev: 1)*

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
1.1	Notification of Target Quantity for First Contract Year, including estimate for dredging quantity.	**Not applicable.** Action completed during early stages of project. Reference to historic note as recorded in EMP sub-plan: "Refer Operations Manager's notice of 17 Jan. 2001".
1.2	Proportioning of Target Quantity for the First Contract Year to be delivered to each placement location.	**Not applicable.** Action(s) completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Draft delivery program reviewed at Advisory Committee meeting on 11 Jan. 2001 and approved by Working Group at meeting of Jan. 2001. Note: Delivery program also presented at the combined Advisory Committee / Beach Nourishment Group meeting on 31 Jan. 2001." "Review for the First Contract Year was carried out in Dec. 2001 and Apr. 2002." "Refer Brown and Root's notice to Operator of 30 Jan 2001."
1.3	Measurement of sand quantities delivered to the nominated outlets and placement areas by the sand bypassing system.	**Compliant.** See Section 3.2.
1.4	Notification of the proposed Target Quantity of sand to be delivered in the following Contract Year, if it is in excess of 700,000m³.	**Not triggered.** Not required during this monitoring period.
1.5	Specification of the Target Quantity (TQ) and proportions to be delivered to each placement location in the following Contract Year (except for the First Contract Year).	**Compliant.** Letter issued to operator on 25 October 2023 (CA-TFN-CY22-TQ2) specifying Target Quantity and proportions to

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		be delivered.
1.6	Notification of the estimated total quantities of sand to be delivered in the current Contract Year and proposed quantity of sand to be delivered by dredge in the following Contract Year.	**Compliant.** Letter issued to operator on 25 October 2023 (CA-TFN-CY22-TQ2) specifying Target Quantity and proportions to be delivered.
1.7	Monitor Operator compliance.	**Compliant.** Refer Appendix F.
2.1 to 2.6	Baseline environmental monitoring programs and community consultation undertaken during the construction and commissioning of the permanent sand bypassing system (February 2000 to 3 May 2001).	**Not applicable.** Action(s) completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: -in relation to beach and offshore survey from Fingal to Currumbin (Task 2.1): "Baseline surveys carried out in Feb./Mar. 2000 and in Dec. 2000/Feb. 2001". -in relation to beach and surf quality observations (Task 2.2): a) Rainbow/ Snapper Rocks video "Continuous video capture recorded from Sept. 1995 to commissioning of system. b) Beach and surf observations by Messrs. Mason and Ford, Tweed River entrance to North Kirra. "Ongoing during the construction and commissioning of the jetty-based sand bypassing system". Commenced Feb. 1997. c) Survey of upper beach profiles from Letitia Spit to Kirra Beach and Snapper Rocks nearshore profiles "Baseline surveys were carried out in April, July, and Sept. 2000 and Jan. 2001". d) Survey of upper beach COPE profile at Rainbow Bay "Baseline COPE surveys carried out in August and November 2000 (in addition to survey of the upper

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		beach profile at Rainbow Bay listed in Item 2.2 c)". -in relation to aerial photography of the southern Gold Coast beaches (Task 2.3): "Baseline photography captured in May and Sept. 2000". -in relation to Nearshore directional wave measurements (Task 2.4): "Continuous wave record has been measured at the Tweed Entrance buoy since Jan. 1995." -in relation to Assessment of longshore sand transport supply (Task 2.5): Marked as complete with Target date January/ February 2001. -in relation to Community Feedback (Task 2.6): "Advisory Committee meetings held in Jan., Mar., May, Aug. Oct., Nov. and Dec. 2000, and on 11 and 31 Jan. 2001".
3.1	Preparation of a schedule for ongoing monitoring activities for approval by the TRESBP Working Group.	**Compliant.** Initial schedule reviewed at Working Group meeting on 12 Jan 2001 as per historic notes recorded in EMP sub-plan. Ongoing - annual monitoring schedule is prepared as part of yearly budget and approved by Working Group. Monitoring is periodically reviewed as part of monthly finance/ budget updates.
3.2	Comprehensive survey of the upper beach and nearshore area from Fingal to Currumbin.	**Compliant.** See section 4.5 and Appendix C Surveys.
3.3	Beach and surf quality observations, Letitia Spit to North Kirra Beach.	**Compliant.** See section 5.6 and Appendix A Supporting Information - Item 6 Beach Photos.
3.4	Aerial photography of the southern Gold Coast beaches.	**Compliant.** See section 4.8 and Appendix A Supporting Information - Item 5 Aerial

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		Photography.
3.5	Nearshore Directional Wave Measurements.	**Compliant.** See section 5.1 and Appendix A Supporting Information – Item 1 Wave Climate.
3.6	Assessment of Longshore Sediment Transport.	**Compliant.** See section 5.3 and Supporting Information – Item 7 Beach width and compartment volume analysis.
3.7	Condition of beach stormwater outlets in the project area when pumping to Kirra upper beach.	**Not triggered.** No sand pumped to Kirra outlet during period.
3.8	Prepare procedures and criteria for analysing monitoring data, including assessment of local coastal processes.	**Compliant.** See section 5.0 for analysis. Procedures/ methodology for analyses are largely defined in proposals from consultants e.g. reef monitoring, tidal analysis, hydrographic survey.
3.9	Analyse and report on the results of the monitoring program.	**Compliant.** See section 5.0 for monitoring outputs on environmental performance.
3.10	Develop and implement procedures for corrective action if any significant impacts are detected that are a consequence of the delivery by the sand bypassing system of sand quantities ordered in accordance with this sub-plan.2	**Compliant.** Corrective action process included in sub-plans, and any issues reported at Working Group.
4.1	Consultation with the surfing community, beach users, the local community and other stakeholders with regard to beach management and surf quality issues along the southern Gold Coast beaches.	**Compliant.** Refer section 6.0 relating to community engagement.
4.2	Organise stakeholder and public meetings to discuss issues relating to beach management (prior to the commencement of Operations)	**Not applicable.** Relates to earlier stages of project. Kirra Surfrider meeting held on 16 Oct. 2000. Public meetings held on 4 Nov. and 16 Nov. 2000.
4.3	Develop a mechanism for wider community feedback.	**Compliant.** Refer section 6.0, the TSB can be contacted via our website, TSB email,

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		social medial (Instagram) Advisory Committee community representatives (meetings held quarterly).
4.4	Identify the community's primary concerns for each beach / placement area along the southern Gold Coast.	**Compliant.** Refer section 6.0 relating to community engagement.
4.5	Document outcomes from Beach Nourishment Group meetings and record in the Consultation Register.	**Compliant.** BNG previously disbanded. Refer section 6.0 relating to community engagement.
4.6	Review the effectiveness of the community feedback mechanism.	**Compliant.** The community meetings as per section 6.0 continue to operate.

Sub-plan B14: Kirra Reef Management *(5 April 2007 Rev: 1)*

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
1.1 & 1.2	Establish a Sand Placement Exclusion Zone in the TRESBP Contract Agreements to provide a buffer zone of approximately 100 m surrounding Kirra Reef, and Ensure C.A. specification of the Kirra Reef Exclusion Zone is covered by current Queensland sand placement approvals.	**Not applicable.** Completed in early stages of project, the TRESBP CA was signed on 22 December 1999.
1.3	Develop and implement operational procedures to prevent direct placement of sand in the Kirra Reef Sand Placement Exclusion Zone.	**Compliant.** Procedures in sub-plan B3 Sand Retrieval and Placement Strategy. Refer to TRESBCo Annual Environmental Monitoring Report (Appendix F) for evaluation of compliance against this sub-plan.
1.4	Monitor Operator compliance.	**Compliant.** Surveys undertaken throughout year to monitor Operator compliance including pre and post dredging surveys and additional entrance surveys. Operator provides, equipment calibration records to Governments and recorded quantities of sand delivered via the system.
2.1	Investigate the natural extent of Kirra Reef prior to the extension of the Tweed River breakwaters.	**Not applicable.** Completed in early stages of project.
2.2 (a)	Baseline hydrographic survey of the seabed levels in the vicinity of the reef.	**Not applicable.** Completed in early stages of project. Survey carried out during Feb. 2001.
2.2 (b)	Baseline monitoring of the existing reef marine biota.	**Not applicable.** Completed in early stages of project. Marine flora and fauna baseline survey carried out during Jan. 2001.
2.2 (c)	Baseline photogrammetric mapping of Kirra Reef using vertical aerial photography captured prior to the commencement of operations.	**Not applicable.** Completed in early stages of project.

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
2.3 (a)	Preparation of a monitoring schedule for Kirra Reef, for approval by the TRESBP Working Group.	**Compliant.** Initial schedule reviewed at Working Group meeting on 12 Jan 2001 as per historic notes recorded in EMP sub-plan. Ongoing - annual monitoring schedule is prepared as part of yearly budget and approved by Working Group. Monitoring is periodically reviewed as part of monthly finance/ budget updates. See section 4.1 Monitoring Program.
2.3 (b)	Hydrographic survey of the seabed elevations in the vicinity of the reef.	**Compliant.** See section 4.1. Full coastal surveys undertaken in May and November 2023.
2.3 (c)	Aerial photography of the reef as part of the TRESBP coastline aerial photography program.	**Compliant.** See section 5.7 Reef monitoring outputs.
2.3 (d)	Photogrammetric mapping of Kirra Reef using vertical aerial photography.	**Compliant.** See section 5.7 Reef monitoring outputs.
2.3 (e)	Survey of upper beach profile at Kirra Beach.	**Compliant.** See section 4.1. Full coastal surveys undertaken in May and November 2023.
2.3 (f)	Monitoring of turbidity if sediment plumes are observed to extend into the Placement Exclusion Zone due to nearby sand placement activities.	**Not triggered.** Operator reported that no turbidity plumes were reported or observed greater than 50m from point of discharge during the monitoring period. No sand was pumped to the Kirra outlet during the period and sand was delivered/ placed at locations away from Kirra Reef i.e. snapper rocks east, southern 2A placement area.
2.3 (g)	Monitoring of the reef marine biota if ongoing monitoring identifies unexpected impacts due to sand placement activities by the sand bypassing system.	**Compliant.** See section 5.7 Reef monitoring outputs.

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
2.4	Prepare a procedure and criteria for analysing monitoring information.	**Compliant.** Criteria required for monitoring detailed in request for quote when engaging suitably qualified and experienced consultant to undertake works. Consultant proposes procedure and method for analysis as part of quote. See section 4.7 for monitoring details.
2.5	Analyse and report on the results of the monitoring program.	**Compliant.** See section 5.7 and Appendix A Supporting Information – Item 3 Reef Monitoring.
2.6	Develop and implement procedures for corrective action if any significant unexpected impacts resulting from sand placement activities by the sand bypassing system are detected.	**Compliant.** Corrective action process included in sub-plans, and any issues reported at Working Group.

Sub-plan B15: Duranbah Surf Quality & Beach Amenity Management *(5 April 2007 Rev: 1).*

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
1.1	Notification of Target Quantity for First Contract Year, including estimate for dredging quantity.	**Compliant.** Action completed during early stages of project. Reference to historic note as recorded in EMP sub-plan: "Refer Operations Manager's notice of 17 Jan. 2001".
1.2	Specification of the portion of the Target Quantity for delivery to Duranbah Beach in the First Contract Year.	**Compliant.** Action completed during early stages of project. Reference to historic note as recorded in EMP sub-plan: "Draft delivery program reviewed at Advisory Committee meeting on 11 Jan. 2001 and approved by Working Group at meeting of 12 Jan. 2001. Note: Delivery program also presented at the combined Advisory Committee / Beach Nourishment Group meeting on 31 Jan. 2001."
1.3	Measurement of sand quantities delivered to the nominated locations by the sand bypassing system.	**Compliant.** See Section 3.2.
1.4	Notification of the proposed Target Quantity of sand to be delivered in the following Contract Year, if it is in excess of 700,000m³.	**Not triggered.** Not required during this monitoring period.
1.5	Specification of the Target Quantity and proportions to be delivered to each placement location in the Duranbah Placement Areas in the following Contract Year (except for the first Contract Year).	**Compliant.** Letter issued to operator on 25 October 2023 (CA-TFN-CY22-TQ2) specifying Target Quantity and proportions to be delivered.
1.6	Notification of estimated total quantities of sand to be delivered in the current Contract Year and proposed quantity to be delivered by dredge in the following Contract Year.	**Compliant.** Letter issued to operator on 25 October 2023 (CA-TFN-CY22-TQ2) specifying Target Quantity and proportions to be delivered.
1.7	Monitor Operator compliance. Procedures for monitoring sand delivery and auditing performance to	**Not Applicable.** Not required during this monitoring period.

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
	be developed prior to commencement of operation.	
2.1 to 2.7	Baseline environmental monitoring programs and community consultation undertaken during the construction and commissioning of the permanent sand bypassing system (February 2000 to 3 May 2001).	**Not applicable.** Action(s) completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: -in relation Beach and surf observations by Messrs. Mason and Ford, Tweed River entrance and Duranbah Beach (Task 2.1): "Ongoing during the construction and commissioning of the jetty-based sand bypassing system". Commenced Feb. 1997. -in relation to survey of Duranbah upper beach profiles (Task 2.2): "Baseline surveys carried out in April, July, & Sept. 2000 and Jan. 2001". -in relation to aerial photography of the Tweed River entrance and Duranbah beach (Task 2.3): "Baseline photography captured in May and Sept. 2000." -in relation to Tweed River entrance surveys (Task 2.4): "Baseline surveys carried out in April, July, and Sept. 2000 and Jan. 2001". -in relation to Nearshore directional wave measurements (Task 2.5): "Continuous wave record has been measured at the Tweed Entrance buoy since Jan. 1995." -in relation to Assessment of longshore sand transport supply (Task 2.6): Marked as complete with Target date January/ February 2001. -in relation to Community feedback (Task 2.7): "Advisory Committee meetings held in Jan., Mar., May, Aug. Oct., Nov. and Dec. 2000, and on 11 and

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		31 Jan. 2001".
3.1	Preparation of a schedule for ongoing monitoring activities for approval by the TRESBP Working Group.	**Compliant.** Initial schedule reviewed at Working Group meeting on 12 Jan 2001 as per historic notes recorded in EMP sub-plan. Ongoing - annual monitoring schedule is prepared as part of yearly budget and approved by Working Group. Monitoring is periodically reviewed as part of monthly finance/ budget updates. See section 4.1 Monitoring Program.
3.2	Regular beach and offshore survey.	**Compliant.** See section 4.1 and Appendix A Supporting Information – Item 8 Surveys. Full coastal surveys undertaken in May and November 2023.
3.3	Regular beach and surf quality observations.	**Compliant.** See section 5.6 and Appendix A Supporting Information - Item 6 Beach Photos.
3.4	Regular aerial photography of the Tweed River entrance and Duranbah Beach	**Compliant.** See section 4.8 and Appendix A Supporting Information - Item 5 Aerial Photography.
3.5	Ongoing nearshore directional wave measurements.	**Compliant.** See section 5.1 and Appendix A Supporting Information – Item 1 Wave Climate.
3.6	Ongoing assessment of longshore sand transport supply.	**Compliant.** See section 5.3 and Supporting Information – Item 7 Beach width and compartment volume analysis.
3.7	Regular Tweed River entrance surveys.	**Compliant.** See section 4.1 and Appendix A Supporting Information – Item 8 Surveys.

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
3.8	Preparation of procedures and criteria for analysing monitoring data, including assessment of local coastal processes.	**Compliant.** See section 5.0 for analysis.
3.9	Analyse and report on the results of the monitoring program.	**Compliant.** See section 5.0 for analysis.
3.10	Develop and implement procedures for corrective action if any significant unexpected impacts are detected that are a consequence of the operation of the sand bypassing system.	**Compliant.** Corrective action process included in sub-plans, and any issues reported at Working Group.
4.1	Consultation with the surfing community, beach users, the local community and other stakeholders with regard to surf quality and beach amenity issues at Duranbah Beach.	**Compliant.** Refer section 6.0.
4.2	Organise public meetings to discuss issues relating to surf quality and beach amenity (prior to the commencement of operations).	**Not applicable.** Relates to earlier stages of project. Public meetings held on 4 Nov. and 16 Nov. 2000.
4.3	Develop a mechanism for wider community feedback.	**Compliant.** Refer section 6.0.
4.4	Identify the community's primary concerns in regard to Duranbah Beach.	**Compliant.** Refer section 6.0.
4.5	Document the outcomes from the Beach Nourishment Group meetings-and record in the Consultation Register.	**Compliant.** BNG previously disbanded. Stakeholder consultation occurs in its place as per section 6.0.
4.6	Review the effectiveness of the community feedback mechanism.	**Compliant.** The community meetings as per section 6.0 continue to operate.

Sub-plan B16: Tweed River Entrance & Lower Estuary Management *(4 April 2007 Rev: 3)*

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
1.1 to 1.3, 1.5 to 1.8	Baseline environmental monitoring programs undertaken during the construction and commissioning of the permanent sand bypassing system (February 2000 to 3 May 2001).	**Compliant.** Action(s) completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: -in relation to lower estuary tidal levels (Task 1.1): "Ongoing program that commenced prior to the TRESBP Stage 1 entrance dredging works." -in relation to survey of lower Tweed River (Task 1.2): "Baseline surveys carried out in Feb. and Aug. 2000." -in relation to aerial photography of the lower Tweed River Estuary (Task 1.3): "Baseline photography captured in May 2000, Sep 2000 and Feb 2001." -in relation to Nearshore directional wave measurements (Task 1.5): "Continuous wave record has been measured at the Tweed Entrance buoy since Jan. 1995." -in relation to assessment of wave propagation into the Tweed River entrance (Task 1.6): "Continuous wave record has been measured at the Zwarts Pole since Jan. 1995." -in relation to Low level aerial photography of the Tweed River breakwaters (Task 1.7): "Baseline photography captured in May 2000." -in relation to Tweed River Entrance surveys (Task 1.8): "Baseline surveys carried out in April, July, & Sept. 2000 and Jan. 2001."
1.4	Baseline mapping of wetland extent.	**Compliant.** Action(s) completed during early stages of project. Reference to historic notes

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		as recorded in EMP sub-plan: "Baseline mapping was carried out by Pacific Wetlands using aerial photography captured on 13 May 2000."
2.1	Preparation of a schedule for ongoing monitoring activities for approval by the TRESBP Working Group.	**Compliant.** Initial schedule reviewed at Working Group meeting on 12 Jan 2001 as per historic notes recorded in EMP sub-plan. Ongoing - annual monitoring schedule is prepared as part of yearly budget and approved by Working Group. Monitoring is periodically reviewed as part of monthly finance/ budget updates. See section 4.1 Monitoring Program.
2.2	Measurement of lower estuary tidal levels.	**Compliant.** Water level and tidal data is continuously recorded at station Letitia 2A by Manly Hydraulic Laboratory (NSW). See section 5.2 and Appendix A Supporting Information – Item 2 Tidal Analysis.
2.3	Survey of the lower Tweed River.	**Compliant.** See section 5.8 and Appendix A Supporting Information – Item 8 Surveys. Survey of the Lower Tweed River completed in August 2023 by CSIRO.
2.4	Aerial photography of the lower Tweed River estuary.	**Compliant.** See section 4.8 and Appendix A Supporting Information - Item 5 Aerial Photography.
2.5	Mapping of wetland extent.	**Not triggered.** Completely annually for the first 5 years of operation (frequency to be reviewed thereafter). No changes to tidal regimes recorded during the monitoring period that would cause impact to wetland extents.

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
2.6	Nearshore directional wave measurements.	**Compliant.** See section 5.1 and Appendix A Supporting Information – Item 1 Wave Climate.
2.7	Assessment of wave propagation into the Tweed River entrance.	**Compliant.** Zwarts Pole decommissioned. Training walls inspected by Transport for NSW (Maritime – MIDO). No evidence of impacts from wave propagation. Water level and tidal data is continuously recorded at station Letitia 2A by Manly Hydraulic Laboratory (NSW). See section 5.2 and Appendix A Supporting Information – Item 2 Tidal Analysis. No significant long or short term elevations at gauge location. VMR entrance usage data collected. No feedback in relation to waves propagating within the entrance.
2.8	Low level aerial photography of the Tweed River breakwaters.	**Compliant.** Training walls inspected by Transport for NSW (Maritime – MIDO) report includes low level aerial imagery of breakwaters.
2.9	Tweed River Entrance Surveys	**Compliant.** See section 4.1 and Appendix A Supporting Information – Item 8 Surveys.
2.10	Prepare procedures and criteria for analysing monitoring data, including assessment of local coastal processes.	**Compliant.** Criteria required for monitoring detailed in request for quote when engaging suitably qualified and experienced consultant to undertake works. Consultant proposes procedure and method for analysis as part of quote. See section 5.0 for monitoring outputs.
2.11	Analyse and report on the results of the monitoring program.	**Compliant.** See section 5.0 for outputs of monitoring.

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
2.12	Develop and implement procedures for corrective action if any significant or unexpected impacts are detected that are a consequence of the operation of the permanent sand bypassing system.	**Compliant.** Corrective action process included in sub-plans, and any issues reported at Working Group.
3.1	Consultation with Tweed Shire Council at Working Group level during the preparation of the Tweed River Entrance and Lower Estuary Management sub-plan.	**Compliant.** Action(s) completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Draft EMS submitted to Working group during Sept. 2000 and on 6 Dec. 2000"
3.2	Consultation with TSC with regard to: (a) the preparation and implementation of the project's shoal remedial nourishment strategy, and (b) development by Council of a broader scoped Lower Estuary Shoals Management Plan under its Tweed River Management Plan.	**Compliant.** Action(s) completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Project Director of the Co-ordinating State attended the River Management Plan Action Committee meeting of 30 Aug. 2000 to discuss the Project's shoal nourishment strategy."
4.1	Ongoing analysis of lower estuary tidal levels.	**Compliant.** See section 5.2 and Appendix A Supporting Information – Item 2 Tidal Analysis.
4.2	Ongoing analysis of lower estuary hydrographic surveys to assess changes in the riverbed and condition of the lower estuary shoals.	**Compliant.** See section 5.8 for monitoring results.
4.3	Undertake a lower estuary shoal remedial nourishment design and environmental review study.	**Not triggered.** Not required during this monitoring period.
4.4	Monitor the Mean Low Water Spring tidal level at the Letitia 2A tidal recorder.	**Compliant.** Water level and tidal data is continuously recorded at station Letitia 2A by Manly Hydraulic Laboratory (NSW). See section 5.2 and Appendix A Supporting Information – Item 2 Tidal Analysis. There were no significant changes in water levels during this reporting period.

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
4.5	If the Letitia 2A MLWS tidal level falls below RL –0.55m AHD on two consecutive months then follow steps outlined in the Lower Estuary Shoals Remedial Nourishment Strategy.	**Not triggered.** Not required during this monitoring period.
4.6 & 4.7	Measurement of sand quantities delivered by the fixed jetty-based system to the lower estuary shoal outlet location; and Monitor Operator compliance.	**Not triggered.** Not required during this monitoring period.
4.8	Review the Lower Estuary Shoals Remedial Nourishment Strategy on a regular basis to ensure consistency with Tweed Shire Council's River Management Plan.	**Compliant.** Tweed River Estuary Coastal Management Program implanted in accordance with the CM Act 2016 is now in place. TSB in consultation with Tweed Shire Council through Working Group and Advisory Committee.
5.1	Establish dredging restriction zones at the head of the breakwaters and in the river channel, within the TRESBP Contract Agreements.	**Not applicable.** Action completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Specification of breakwater clearance zones in the TRESBP Concession Agreement (refer Dwg. No. 9700998- CA-EX11-02). The TRESBP CA was signed on 22 December 1999."
5.2	Establish dredging depth limits in the Entrance Channel area, in the TRESBP contract agreements.	**Not applicable.** Action completed during early stages of project. Reference to historic notes as recorded in EMP sub-plan: "Specification of maximum permissible dredge levels in Removal Area Compartments A and B, in the TRESBP CA (refer Dwg. No. 9700998-CAEX11-02). The TRESBP CA was signed on 22 December 1999."
5.3	Monitor Operator compliance with CA restriction on sand removal.	**Compliant.** Surveys undertaken throughout year to monitor Operator compliance

TASK NO.	REQUIREMENT	COMPLIANCE STATUS MAY 2022 - APRIL 2023
		including pre and post dredging surveys.
6.1	Review the condition of the breakwaters/training walls and entrance bathymetry and wave transmission conditions on a regular basis.	**Compliant.** Training walls inspected by Transport for NSW (Maritime – MIDO) report includes low level aerial imagery of breakwaters. Refer to 5.0 for monitoring of entrance bathymetry and wave conditions.

Appendix F

TRESBCo Environmental Monitoring Report

Tweed River Entrance Sand Bypassing Company

Transport for NSW

Queensland Department of Environment and Science and Innovation

TWEED RIVER ENTRANCE SAND BYPASSING PROJECT
STAGE 2
PERMANENT SAND BYPASSING SYSTEM

ANNUAL ENVIRONMENTAL MONITORING REPORT

MAY 2023 - APRIL 2024

Rev	Date	Details	Author	Reviewer
20/21-1	May 2021	Internal review, submission	G. Smith	M. Ross
21/22-1	May 2022	Internal review, submission	G Smith	M Ross
22/23-1	May 2023	Internal review, submission	G Smith	M Ross
23/24-1	May 2024	Internal review, submission	G Smith	M Ross

CONTENTS

ACRONYMS

ASS	Acid Sulphate Soils
CA	Concession Agreement between McConnell Dowell and the Governments
DA	Development Agreement between McConnell Dowell and the Governments
DGPS	Differential Global Positioning System
EIS/IAS	Environmental Impact Statement/Impact Assessment Study
EMP	environ mental Management Plan
EMR	Environmental Management Representative
EMS	Environmental Management System
GCCC	Gold Coast City Council
Governments	Transport for NSW and Qld Department of Environment and Science on behalf of the Governments
LPPS	Low Pressure Pump Station
MSDS	Material Safety Data Sheet
MP	Monitoring Period - May 2023 - April 2024
PASS	Potential Acid Sulphate Soils
PPE	Personal Protective Equipment
TBLALC	Tweed Byron Local Aboriginal Land Council
TRESBP	Tweed River Entrance Sand Bypassing Project
TSC	Tweed Shire Council

COMPLIANCE STATEMENT

I Gavin Smith, on behalf of the operator - Tweed River Entrance Sand Bypassing Company P/L (TRESBC), certify that this Environmental Monitoring Report has been prepared based on available and known information to provide a true and accurate record of compliance with the relevant environmental requirements and conditions imposed on the operator of the Tweed Sand Bypass system. Further, I am authorised to make this statement on behalf of TRESBC.
Note: This statement is made under the provisions of the Environmental Planning and Assessment Act 1979 Section 122E and the relevant sections of the Crimes Act 1900 relating to penalties for providing misleading or false information.

Authorised Reporting Officer

Name:	Gavin Smith		
Title:	Operations and Maintenance Manager - TRESBC		
Signature:		Date	30 June 2024

Operations and Maintenance Manager

ANNEXURE ONE – CHANGE OF ENTITIES

This document will refer to the government agencies and departments as they were when the original Environmental Monitoring Report was issued in April 2002. For the current agency names, please see the table below.

ACRONYM	FORMER AGENCY	CURRENT AGENCY
NEW SOUTH WALES		
DUAP	Department of Urban Affairs and Planning	Department of Planning and Infrastructure
EPA	Environmental Protection Agency	Environmental Protection Authority (Office of Environment and Heritage)
TfNSW	Transport for NSW	Transport for NSW
DOI	Department of Primary Industries - Lands	Department of Planning, Industry and Environment
NPWS	National Parks and Wildlife Service	Office of Environment and Heritage
Fisheries	NSW Fisheries	Department of Primary Industries
NSW Heritage Council	NSW Heritage Council	Office of Environment and Heritage
Work Cover	Work Cover	Work Cover Authority of NSW
NSW Maritime	NSW Maritime	Roads and Maritime Services
QUEENSLAND		

DESI	Department of Science, Information Technology and Innovation	Department of Environment, Science and Innovation, QLD Government
QEPA1	Queensland Environmental Protection Agency	Department of Environment, Science and Innovation, QLD Government
QEPA2	Queensland Environmental Protection Agency	Department of Environment, Science and Innovation, QLD Government
NRW	Department of Natural Resources and Water	Department of Natural Resources
DPI&F	Department of Primary Industries and Fisheries	Department of Agriculture and Fisheries

1. INTRODUCTION

This report has been prepared to partially fulfill the environmental reporting requirements of the ***Tweed River Entrance Sand Bypassing Project (TRESBP) Environmental Management System - Operations***. It contains the results of the Tweed River Entrance Sand Bypassing Company (TRESBC) environmental monitoring program undertaken between May 2023 and April 2024. It also reports on the following:

- Applications for consents, licenses and approvals, and responses from relevant authorities during the MP.
- Implementation and effectiveness of environmental controls and conditions relating to work undertaken.
- Identification of impact predictions made in the EIS/IAS and other supplementary studies that are the responsibility of the operator and details of the extent to which the actual impacts reflect the predictions.
- Details and analysis of the environmental monitoring program.
- Assessment of compliance with the EMS-Operations sub-plans.
- Number and details of any complaints, including a summary of the main area of complaint, action taken, response given and intended strategies to reduce complaints of a similar nature; and
- Any other matter relating to the compliance with the conditions of approval, or as requested by the Approving Authorities.

2. ENVIRONMENTAL MANAGEMENT SYSTEM

The Environmental Management Plan - Operations (EMP-Operations) has been prepared to as part of the environmental approval process for Stage 2 of TRESBP. It is based upon the requirements arising from the NSW conditions of environmental planning approval, the recommendations of the Queensland Impact Assessment Review Report, the EIS/IAS and Representations Report, all relevant Acts and Regulations and accepted best practice management plans.

This EMP covers the environmental management for the operation of the project including any supplementary dredging and nourishment activities. It provides a framework for the controls, mitigating measures, monitoring and auditing procedures necessary to prevent or ameliorate potentially adverse environmental effects resulting from the operation of the fixed bypassing system.

This EMP has been prepared for the Tweed Sand Bypassing Project, following consultation with relevant government agencies including:

- Department of Environment and Science, Queensland Government
- NSW National Parks and Wildlife Service
- NSW Fisheries
- TRESBP Working Group and Advisory Committee
- Tweed Shire Council
- Gold Coast City Council
- Other local community groups

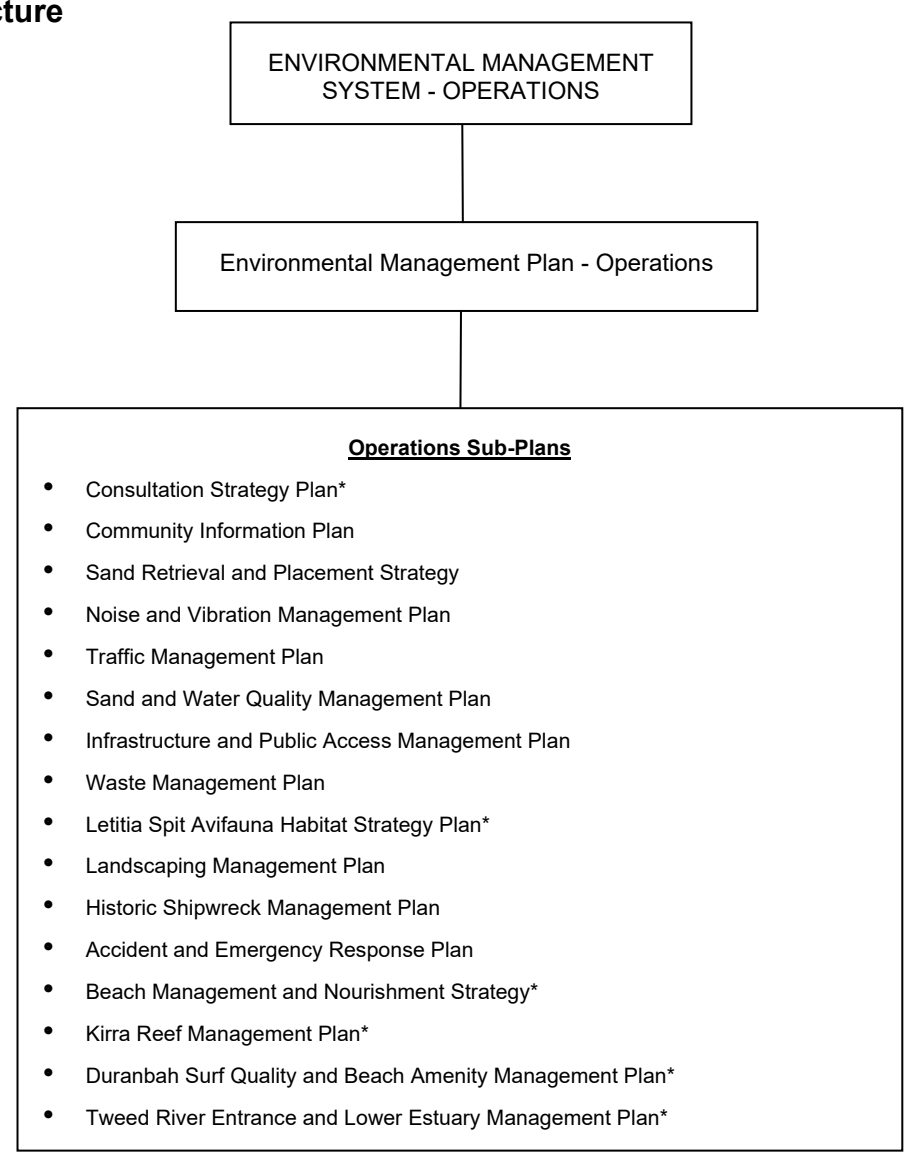
3. ENVIRONMENTAL MANAGEMENT PLANS AND SUB-PLANS

To manage key environmental performance requirements, an Environmental Management Plan (EMP) for the operations, supplementary dredging and nourishment works of the project have been developed. Each EMP contains separate sub-plans to manage key environmental

and performance issues. These sub-plans also specify the assignment of resources and responsibilities for achieving the environmental requirements.

The structure of the EMP and its sub-plans are listed below.

EMP Structure



NB – The Operator is responsible for the implementation of the above sub-plans except for those marked * for which the Governments are responsible.

4. APPLICATIONS FOR APPROVALS, LICENCES AND CONSENTS

An Environmental Impact Statement (EIS) and an Impact Assessment Study (IAS) for the permanent bypassing system (Stage 2) was prepared by the Hyder Joint Venture and released in July 1997. Following a public exhibition and submission phase, additional environmental assessment was undertaken to consider the impact of the project on threatened species. The EIS/IAS provides a summary of the benefits and impacts associated with the different options associated with the permanent sand-bypassing project in Section 7 - 92. These significant impacts have been addressed by establishing, implementing and maintaining the EMP Sub-Plans for the project.

Details of applications for approvals, licenses and consents from various authorities as well as details of their status are outlined in the table below.

Table 2.4.1 – Status of Approvals, Licenses and Consents – May 2023

Legislation	Department	Permit/Licence/ Approval/ Obligations	Status
New South Wales			
Environmental Planning and Assessment Act, Part V,	DUAP	• Approval of Environmental Management Plan (Approval Conditions 12, 13 & 14).	• Approval gained on 18th February 2000.
		• Approval of Environmental Representative for construction (Approval Condition 11).	• Approval gained on 18th February 2000.
		• Approval of Acid Sulphate Soils Management Plan (Approval Condition 30).	• Approval gained on 17th May 2000.
Heritage Act 1977, Division 2 of Part 4		Approval required for any development (including excavation) of land in which a heritage item is located.	Not required. No heritage items were found in the vicinity of the construction area.
Protection of Environmental Operations Act 1997	EPA	Obtain license for any scheduled development works under Chapter 3.	Original EPA License issued on 18th April 2000. Renewal License effective as of 13 April 2024.
Coastal Protection Act 1979	DOI	Concurrence from Minister for development in Coastal Zone.	Obtained.

Legislation	Department	Permit/Licence/ Approval/ Obligations	Status
Commonwealth Historic Shipwrecks Act 1976	NSW Heritage Council	Permit to disturb protected historic shipwrecks.	No protected shipwrecks disturbed.
		Consultation with NSW Heritage Council in preparation of Historic Shipwreck Management Strategy.	Undertaken.
Dangerous Goods Act 1975, Parts III and IV	Work Cover	License for: • Premises storing Dangerous Goods. • Vehicles conveying Dangerous Goods. • Use, handling and other activities involving Dangerous Goods.	No licensing required for the quantities of Dangerous Goods stored on site.
Threatened Species Conservation Act 1995, s91	NPWS	Inclusion of monitoring and contingency particularly wading birds and shorebirds.	Not required.
Water Act 1912, part 2	Water Ministerial Corporation	License for works involving dewatering and drainage.	No license required as Act only applies to fresh water supplies or irrigation or flood control works.
	DOI	• Concurrence to: • Approval of Environmental Representative for system operation. • Approval of Environmental Auditor.	Obtained.
	NSW Waterways Authority	Adequate Navigation Aids.	Advice received from Waterways Authority on 18 May 2000, on the provision of adequate navigation aids.
Local Government Act 1993	Tweed Shire Council	• Installation of temporary structures • Water supply, sewerage and drainage • Regular local government approvals.	Continually consulting with TSC throughout operations.
Queensland			
Environmental Protection Act 1994	QEPA1	License of Environmentally Relevant Activities under Section 39b.	Not required if a specific Development Approval is in force. Not applicable.

Legislation	Department	Permit/Licence/ Approval/ Obligations	Status
		Duty to notify Serious and Material environmental harm.	
Environmental and Other Legislation Amendment Act 1997	QEPA1	Approval for removal of contaminated soil or remediation of contaminated site.	Not applicable.
Coastal Protection & Management Act 1995 *(Previous Harbours Act 1955, Section 86)*	QEPA2	Permit required for construction in tidal waters (includes discharge outlets and placement of sand by dredge).	Section 86 for the installation of fixed and flexible pipe outlets on southern Gold Coast beaches issued on 30-Aug-2000. Section 86 for refined dredging nourishment design issued on 16 May 2001.
Coastal Protection and Management Act 1995 (previously Beach Protection Act 1968)	Beach Protection Authority	Permit required for works in coastal management control district.	Not required. Outlets are covered within the Coastal Management Plan for the Gold Coast pursuant to the Act.
Fisheries Act 1994	DPI&F	Permit for disturbance to marine flora.	Not required.
Gold Coast City Council local laws	Gold Coast City Council	Regular local government approvals.	Consultation has been undertaken with GCCC on a number of matters including detailed design drawings, Traffic Management Plan, Landscaping Management Plan and Section 86 *Harbours Act* application.
Integrated Planning Act 1997	GCCC	Development Permit for Operational Works.	Development Permit for Operational Works received on 10 August 2000.
Land Act	NRW	Land Lease required.	Land Lease commenced on 01 December 2001.

5. EVALUATION OF OPERATIONS IMPACT PREDICTIONS MADE ON THE EIS/IAS

A list of operation predictions made in the EIS/IAS and other supplementary studies with an evaluation of the extent to which the actual impacts reflect the predictions is given in the table below.

Environmental Criteria	Impacts	Sand Retrieval, Transport and Placement Predictions	Evaluation
Surface Topography and Drainage	Positive	• No changes to surface topography in upper reaches of estuary. • Existing drainage patterns unaltered. • Tidal levels and influence unaltered. • Protection and enhancement of beach and dune systems in the nourishment areas. • No impact from Acid Sulphate Soils.	• No impact evident within estuary
	Negative	• Recession of coastline at Letitia Spit.	• Recession has occurred along northern and central Letitia Beach. • Back passing by dredge to Fingal was carried out during this MP. • Aerial imagery and volume calculations on Letitia are carried out to monitor the recession.
Wave Propagation	Positive	• Wave steepening and shoaling will be reduced in entrance bar channel.	• Generally, channel bathymetry was maintained in the entrance channel area during the MP • Observed breaking waves during large swell events.
	Negative	• Altered wave refraction may affect surfing quality at Duranbah Beach. • Increased exposure of training walls to storm waves. • Increase of wave penetration into estuary but no significant impacts.	Positive feedback on surf quality at Duranbah has been observed during MP.
Turbidity	Positive	• Turbidity plumes will be contained within an approx. distance of 50m from the point of discharge. • However, plume will be short lived and last some 2-3 minutes after cessation of sand pumping activities.	No observed or reported turbidity plumes greater than 50 m from point of discharge observed during MP.
	Negative	No system specific impacts.	No impact evident.
Water Quality	Positive	No system specific impacts.	No impact evident.
	Negative	No system specific impacts.	No impact evident.
Sediment Quality	Positive	Sand on the bar is part of the longshore continuum between Letitia Spit and Gold	No impact evident.

Environmental Criteria	Impacts	Sand Retrieval, Transport and Placement Predictions	Evaluation
		Coast beaches hence no adverse impact on sediment quality.	
	Negative	No system specific impacts.	• No impact evident.
Beach Systems	Positive	• Improved coastal protection and beach amenity of southern Gold Coast. Allows nourishment of offshore profile i.e. re-establishment of long-term bathymetry.	• Beach widths continue to naturally fluctuate and are primarily dependant on seasonal wave activity and the occurrence of storm events.
	Negative	• Localised retreat of beach south of Tweed River entrance. • Modification of dune system at Letitia Spit however present beach and dune system are largely artificial due to construction of training walls.	• The observed recession near the jetty is up to 90m and the foreshore recession is relatively uniform along the northern part of the beach, recession southward from the jetty towards central Letitia Spit • Pumping strategy to promote beach rebuilding. • Back passing by dredge to Fingal was carried out during MP. • Aerial imagery and volume calculations on Letitia are carried out to monitor the recession.
Tweed River Entrance	Positive	• Entrance bar channel depth maintained.	• Clear Navigation Channel depth was not maintained between 13 April 2023 – 26 June 2023.
	Negative	• Depending on the bar depth the height of waves during severe storms may be increased leading to possible damage or failure of training walls. • Bar configuration will have impact on height of waves breaking against walls. Depending on bar depth,	• No significant impact evident on the training walls during the MP.
Tweed River Estuary	Positive	• Change in tidal levels will not be significant. • In conjunction with the Tweed Estuary Management Plan, improvement of tidal mixing and flushing (improved water quality) of main arm. • Substantial reduction of net in-feed of marine sand into estuary. • No impact on flood flows. • No threat to existing internal training wall or parkland behind from wave penetration. • No significant impact on storm surge into the estuary.	• No impact evident within the estuary

Environmental Criteria	Impacts	Sand Retrieval, Transport and Placement Predictions	Evaluation
	Negative	Lower estuary marine shoals will be slower to recover from flood events.	• No impact evident within the estuary
Marine Ecology	Positive	• The jetty mounted system may create new reef type habitat. • Re-establishment of new reef habitats on any trestle structure.	• Not specifically monitored. • Observations during daily activities indicate significant fish numbers around the jetty infrastructure
	Negative	• The jetty mounted system may cause alteration of species composition • The jetty mounted system may create zones devoid of benthic invertebrates. • Potential alteration of the path of migrating fin fish • Potential sand migration onto Kirra Reef. However, such movement would replicate historical natural sand transport patterns	• Aquatic habitats in the vicinity of the jetty not specifically monitored. • The sand trap zone beneath the jetty from where sand is pumped is a very small plan area within the greater Letitia embayment. Note: • No impact observed at Kirra during the MP - refer to publications on https://www.tweedsandbypass.nsw.gov.au/environmental-monitoring/kirra-reef-monitoring.html and Appendix A9 of the Concession Agreement.
Estuarine Ecology	Positive	• Negligible impact in tidal ranges. • Insignificant direct ecological impacts. • Permanent system will result in stabilisation of intertidal wetlands. • Mitigating measures available to maintain the tidal range at pre-flood conditions such as installation of temporary sand pumping pipeline from the permanent bypassing system. • Improved tidal flushing will improve water quality.	• No significant impact evident within the estuary • No requirement for mitigating measures.
	Negative	Potential to inhibit migratory fish species from entering Tweed River estuary.	• Not specifically monitored but no significant tidal flow impact evident
Shorebirds	Positive	No system specific impacts.	• Not specifically monitored. • Ospreys continue to nest on extended pole tower on the jetty structure - no chicks in 2023.
	Negative	• Operation of the fixed jetty mounted system will disturb waterbird roosts at South Head beach and kerosene Inlet. • Clear water intake may disturb major roosts in Tweed River estuary.	• No impact evident. Note: Not specifically monitored this period but operation of fixed jetty system has small footprint on Letitia Spit beach and is remote from Kerosene Inlet. Operation of clean water intake involves very little disturbance activity and is located along a rock revetment river training wall away from major roosts in estuary.

Environmental Criteria	Impacts	Sand Retrieval, Transport and Placement Predictions	Evaluation
Land use, Zoning and Tenure	Positive	• No significant impact on private land holdings or zoning. • No changes to private property boundaries. • No need to formally acquire lands.	• No impact evident.
	Negative	• No system specific impacts.	• No impact evident.
Aboriginal and Post Contact Heritage	Positive	• No system specific impacts.	• No impact evident.
	Negative	• No system specific impacts.	• No impact evident.
Socio-economic Profile	Positive	• Substantial recreational and economic impacts.	• Beach widths will continue to naturally fluctuate primarily due to seasonal wave conditions and the occurrence of large storm events. • Clear Navigation Channel depth was not maintained between 13 April 2023 – 26 June 2023.
	Negative	• No system specific impacts.	• No impact evident.
Business, recreation and Tourism	Positive	• Recreational fishing may be improved due to creation of reef-like habitat and provision of public access to a jetty structure. • Improved viability of the Tweed fishing industry. • Increased boating (including ocean going vessels) within Tweed estuary. • Establish consistent, good surfing and beach amenity in all seasons. • Revenue from tourism likely to increase. • Benefit to local commercial and retail businesses. • Oyster fisheries will benefit from improved tidal flushing of estuary. • Possibility of local employment benefits.	• No negative impact observed by operator.
	Negative	• No system specific impacts.	• No impacts evident.
Visual Amenity	Positive	• No system specific impacts.	• No impacts evident.
	Negative	• Highly visible from major vista points. • Permanent, therefore long-term visual impact.	• Jetty structure and LPPS are long-term highly visible impacts. No significant adverse reactions, due to public consultation undertaken during construction. • No complaints regarding the appearance of structures have been received.

Environmental Criteria	Impacts	Sand Retrieval, Transport and Placement Predictions	Evaluation
		• High existing visual sensitivity of Letitia Spit. • Large size and industrial appearance. • Exposed outlets are permanent and partially visible from major vista points	
Navigation	Positive	• Increased safety of navigation of entrance particularly during incoming tide. • Infilling of navigation channels within the estuary reduced. • Potential infilling of the secondary channel of main arm reduced. • Larger vessels will be able to navigate the entrance more safely.	• Safety improved. • Deeper wider channel allows for larger vessels to safely navigate the channel. • No significant impact evident on other indicators
	Negative	• Due to natural bypass of longshore transport occasional bar dredging will be required.	• Clear Navigation Channel depth was not maintained between 13 April 2023 – 26 June 2023.
Noise	Positive	Potential to ameliorate noise generated.	• Noise amelioration measures in place. No complaints received
	Negative	• Increased noise resulting from plant at the restaurant and Clubhouse at Jack Evans Boat Harbour. • Increased noise at Eden and Bay Streets. • Noise impacts on ecology. • Tweed River foreshore between Jack Evans Boat Harbour and Terranora Inlet areas has high noise sensitivity.	• Noise study undertaken in 2001. No significant noise increases evident. • Clean water pump station and jetty sand pumping facility located remote from residential and other noise sensitive areas
Air Quality	Positive	System electrically powered therefore no emissions in local area.	• No impact evident.
	Negative	No system specific impacts.	• No impact evident.
Traffic	Positive		
	Negative	• Traffic volumes remain high • Dust • Hazardous conditions	• Road remains unsealed and requires ongoing Tweed Shire Council maintenance. Maintenance occurred during the MP. • Excessive dust generated.
Hazard	Positive	• Reduction in hazard by improved navigation.	• Clear Navigation Channel depth was not maintained between 13 April 2023 – 26 June 2023.
	Negative	• Use of entrance by increased number of vessels and inexperienced sailors.	• No impact evident. • No impact evident.

Environmental Criteria	Impacts	Sand Retrieval, Transport and Placement Predictions	Evaluation
		• Potential navigational hazard during operation.	

6. SUB PLANS - RESULTS OF ENVIRONMENTAL MONITORING

Summary Table

Sub Plan Summary				
Sub Plan	Description	Custodian	Compliant	Comments
B2	Community Information Plan	TRESBC	Y	Calls to the operation by the public were regarding site visits by schools for educational purposes and by other interested community groups. All relevant notifications for dredging were issued.
B3	Sand Retrieval and Placement Strategy	TRESBC	Y	409,635m3 pumped and placed during the MP. Observed localised retreat and accretion. Letitia relatively stable through the MP. Sand placed by dredge to Fingal
B4	Noise and Vibration Management Plan	TRESBC	Y	All mitigation measures in place. No impact for the MP
B5	Traffic Management Plan	TRESBC	Y	All mitigation measures in place. No impact for the MP

B6	Sand and Water Quality Management Plan	TRESBC	Y	All mitigation measures in place. Water testing carried out for pumping and dredging as per EPA Guild lines. No impact for the MP.
B7	Infrastructure and Public Access Management Plan	TRESBC	Y	Unauthorised access to jetty occurred during the MP. Tweed water police completing patrols. New security gates installed and Letitia Road closure have reduced the incidence of unauthorised access.
B8	Waste Management Plan	TRESBC	Y	All mitigation measures in place. No Impact for the MP
B10	Landscaping Management Plan	TRESBC	Y	No significant impact for the MP. Weed control carried out, Dune structure stable with minor recession during high tide and large swell events.
B11	Historic Shipwreck Management Plan	TRESBC	Y	All mitigation measures in place. No impact for the MP
B12	Accident and Emergency Response Plan	TRESBC	Y	All mitigation measures in place. No impact for the MP

Sub Plan Monitoring Detail

Task No.	Requirement	Status	Action By Whom
SUBPLAN B2: COMMUNITY INFORMATION PLAN			
2.1	For any significant construction activity likely to affect residents, provide community with adequate information regarding operation activities.	• The Advisory Committee was kept informed.	Operator / Governments

Task No.	Requirement	Status	Action By Whom
2.2	Display information signage in close vicinity of each sand outlet.	• Installed signs monitored weekly. • Vandalised/damaged signs and boards replaced as required.	Operator
2.3	Regularly update Community Information Noticeboards.	• Ongoing procedure. • Notice boards updated with information posters prepared and supplied by TfNSW and DES	Operator / Governments
2.4	Liaise with Volunteer Marine Rescue Pt. Danger regarding any restrictions to navigation in the Tweed River entrance during operations including supplementary dredging and nourishment activities.	• The appropriate agencies were notified prior and during to the 2023 dredging campaign.	Governments Operator Dredging Operator
2.5	Advise Coordinating State of times regarding any interruptions or restrictions to navigation in the Tweed River entrance so that a Notice to Mariners may be issued by the Operator	• The appropriate agencies were notified prior and during to the 2023 dredging campaign.	Governments Operator Dredging Operator
2.6	Investigate and respond to complaints.	• No complaints received	Operator
2.7	Record and report complaints.	• No complaints received.	Operator

Evaluation against performance indicators:

No complaints received in relation to lack of information. Complaints were received by the Governments regarding the beach amenity and surf quality in some locations.

Calls to the operation by the public were regarding site visits by schools for educational purposes and by other interested community groups.

All relevant notifications for dredging were issued.

SUBPLAN B3 – SAND RETRIEVAL AND PLACEMENT STRATEGY

3.1	Brief staff in the requirements of the plan.	• All employees working on site have been inducted in the provisions of this plan.	EMR/Operator
3.2	Minimise nuisance to beach users and any adverse impact on beach and surf amenity.	• Operation has occurred mainly between the hours of 20:00 and 06:30. When pumping to temporary outlets, a security guard has been in place at outlets	Operator
3.3	Consult QLD DPI if temporary relocation of shark control program equipment is required.	• No relocation required.	Operator Dredging Operator

Task No.	Requirement	Status	Action By Whom
3.4	Apply for approval under section 86 of the Harbours act 1955 (QLD) for works in, over, through or across any foreshore or any land lying under the sea within QLD waters.	• Approvals received 31-08-00 & 16-05-01 for the nourishment area design for dredging.	Operator
3.5	Sand Removal – Remove sand from within the Tweed River entrance as defined in CA Schedule 11	• No variance during the MP	Operator/ Dredge Operator
3.6	Removal areas	• No reporting required - Reference only	Operator
3.7	Sand Delivery locations	• No reporting required - Reference only	Operator
3.8	Sand Placement - Place sand removed by the system in accordance with CA Exhibit 10 and Schedule 10.	• No variance during the MP	Operator
3.9	Sand Placement - Addressing Short Term Receiving Capacity and the primary placement area of Snapper Rocks East except under certain circumstances.	• 11,445m3 of sand was pumped onto Duranbah Beach during the MP. This sand placement was staged across 4 locations to encourage formation of inshore banks. • Refer to Appendix C for the monthly quantities delivered and locations.	Operator
3.10	Sand Placement - Addressing Short Term Receiving Capacity for SRE and SRW	• No variance during the MP.	Operator
3.11	The quantity of sand removed and delivered via pumping from the System will be measured in accordance with Part A of CA Schedule 12 - Measurement of Sand Material Removed and Delivered.	• No variance during the MP.	Operator
3.12	Notify the Governments specifying the total amount of sand estimated to be removed by dredging.	• Communicated through the DMS	Operator
3.13	Governments to notify the distribution and total amount to placement areas	• Communicated through the DMS	Government

Task No.	Requirement	Status	Action By Whom
3.14	Select and use dredging plant and equipment suitable for bottom dumping in water depths expected to occur on achievement of the max. Crest levels specified in the current approvals at the placement areas.	• Communicated through the DMS	Operator Dredging Operator
3.15	Dredge Operator to prepare daily log sheets which detail at least the following information (as outlined in CA Schedule 12), and submit to the Manager daily	• Completed for dredging works during the MP	Operator Dredging Operator
3.16	Forward daily log sheet summary to Governments.	• Completed for dredging works during the MP	Operator Dredging Operator
3.17	Measure quantity of sand removed and delivered via dredging.	• Completed for dredging works during the MP	Operator Dredging Operator
3.18	Carry out post dredge and post deposition surveys at the completion of dredging.	• Completed for dredging works during the MP	Operator and Governments
3.19	Develop and implement operational controls to avoid placement of sand in the stage 2 Kirra Reef Placement Exclusion Zone.	• All sand dredged from the entrance was placed in approved locations – Duranbah, Snapper Rocks, Bilinga and Fingal	Operator Dredging Operator Governments
3.20	In respect of each Contract Year, remove from the Removal Areas and place in the Placement Areas, the Target Quantity as notified by Governments.	• Target quantity maintained and notification within the requirements.	Operator
3.21	Notify the Governments in writing of the estimated total quantities of sand delivered, the quantities delivered to each Placement Area at the end of the current Contract Year and the quantity of sand proposed to be removed by dredging in the following Contract Year.	• Completed for MP.	Operator
3.22	Maintain a Clear Navigation Channel.	• Clear Navigation Channel depth was not maintained between 13 April 2023 – 26 June 2023.	Operator
3.23	Monitor sand and water quality in accordance with Sub-Plan B6.	• Completed for MP.	Operator

Task No.	Requirement	Status	Action By Whom
3.24	Promptly inform Governments if dredge hopper is found to contain dredged material that is not Sand Material.	• No material other than Sand Material was dredged	Dredging Operator
3.25	If Governments determine that certain material placed or to be placed in the Placement Areas is not acceptable for beach nourishment purposes, carry out the requirements of Governments as specified by notice in writing.	• No material other than Sand Material was dredged	Governments
3.26	In case of a storm event that could adversely impact on entrance navigation the system may be operated on a 24-hour basis as required subject to restrictions related to the recession of Letitia Spit	• The system was operated for up to 23 hrs per day to suit the sand transport conditions.	Operator
3.27	Operate the System so that general foreshore alignment retreat due to long-term beach recession along Letitia Spit is limited to a maximum of 90 metres in the vicinity of the Works	• System operated to avoid foreshore alignment retreat. The general foreshore alignment retreat was limited to approx. 90m in the vicinity of the jetty over this MP. The “control volume survey” will provide a greater level of confidence to the decision-making process and improvement in the management of sand volumes	Operator
3.28	Undertake Dune Management measures as outlined in Sub-plan B10 – Landscaping Management Plan to manage the gradual recession along Letitia Spit.	• Not required for the MP. Dunes are generally vegetated with Spinifex and other native vegetation. Refer to Appendix D for photographic records	Operator
3.29	Operate the system so that significant disturbance to the upper beach and back beach areas along Letitia Spit is contained within 1000m of the southern training wall.	• Daily visual monitoring of shoreline ongoing. Shoreline recession also monitored through monthly cope pole measurements & quarterly beach profile surveys. •	Operator
3.30	Conduct Regular Channel Surveys of the Entrance Channel Area for certification of establishment of Clear Navigation Channel.	• Surveys conducted Monthly throughout the MP.	Operator / Surveyor
3.31	Conduct Regular Channel Surveys of SRE and SRW monitoring profiles.	• Surveys conducted monthly	Operator / Surveyor
3.32	Conduct Regular Surveys of upper beach monitoring profiles.	• Surveys conducted quarterly.	Operator / Surveyor

Task No.	Requirement	Status	Action By Whom
3.33	Conduct Post Dredge and Post Deposition Surveys.	• Surveys completed as required	Operator / Governments
3.34	Conduct other surveys as directed by Governments.	• Surveys as required completed for the MP	Operator / Governments
3.35	Prepare Survey reports.	• Survey reports prepared and forwarded to relevant stakeholders	Operator / Governments

Evaluation against Performance Indicators:

Clear Navigation Channel

Unavailable	1 May 2023 – 25 June 2023
Available	26 June 2023 – April 2024

Sand delivery during the last 12 months was in general accordance with the sand delivery program provided by Governments.

Outlet	Quantity – m3
Snapper Rocks East	409,635
Duranbah	0

In addition, the survey of upper beach monitoring profiles along Letitia Spit shows:

- Beach recession has occurred along central and northern Letitia Spit. The recession is greatest near the jetty. While the extent of foreshore recession is relatively uniform along the northern part of the beach, the observed recession generally reduces southward away from the jetty along central Letitia Spit.
- Localised beach recession of up to 90 metres has occurred within the immediate proximity of the jetty.
- General foreshore alignment has been relatively stable, lower beach rebuilding had been observed extending south of the jetty over most of this MP.
- Back passing by dredge was carried out in September 2021 to manage the volumes delivered to Queensland and enhance the rebuilding of Letitia Beach.

Location	Quantity – m3
Fingal	10,975
Dreamtime	31,084

No justifiable complaints were received directly by the operator in relation to sand removal and placement.

Task No.	Requirement	Status	Action By Whom
SUBPLAN B4: NOISE AND VIBRATION MANAGEMENT PLAN			
4.1	Document all consultation and the outcome of such consultation carried out during the preparation and implementation of the EMP sub-plan in the Consultation Register.	• Documentation completed	Operator
4.2	Brief operations and maintenance staff in the requirements of the plan.	• All employees working on site have been inducted in the provisions of this plan. New staff briefed as required.	Operator
4.3	Task Completed		
4.4	Anticipated Operations Noise and Vibration for all Major Noise and Vibration Generating Activities	• Complete – Refer Appendix A of Subplan B	Operator
4.5	Ensure night-time operations in QLD does not exceed background noise plus 5dB(A) between 6pm and 10pm, and background plus 3 dB(A) between 10pm and 6am.	• Noise Study performed. • Refer to the Noise Assessment Report. - Environmental Monitoring Report March to April 2001.	Operator
4.6	Ensure night-time operations in NSW do not exceed background noise plus 3 dB(A).	• Noise Study performed. • Refer to the Noise Assessment Report. • Environmental Monitoring Report March to April 2001.	Operator
4.7	Notify affected residences by way of letter drop if significant construction or maintenance work is required.	• No significant construction or maintenance activities during this period.	Operator
4.8	Restrict significant construction and maintenance work that is likely to be audible at nearby residences to normal working hours.	• No significant construction or maintenance activities during this period. All minor construction activities were restricted to the normal working hours.	Operator
4.9	Contact the local NSW EPA for approval to work outside standard hours.	• All maintenance and construction work undertaken during normal working hours. • Procedure implemented.	Operator
4.10	Seek appropriate permission if audible noise is required before 6:30am, after 6:30pm or on a Sunday or public holiday.	• All work activities (maintenance or construction) confined to normal working days and hours.	Operator
4.11	Control deliveries to normal working hours.	• All deliveries limited to normal work hours. Deliveries sometimes restricted by poor condition of Letitia Road.	Operator

Task No.	Requirement	Status	Action By Whom
4.12	Monitor operation noise as required to comply with Environment Protection Licence	• Noise Study performed 12 April 2001.- Refer to the Noise Assessment Report. Environmental Monitoring Report March to April 2001.- Noise measured at monitoring locations within limits.	Operator
4.13	Investigate noise complaints.	• No complaints received.	Operator
4.14	Record and report complaints.	• No complaints received.	Operator
4.15	Check all plant and equipment is suitably acoustically treated and maintained.	• All plant and equipment checked and maintained on a daily / weekly basis. • Major inspections carried out every 6 months. • Ongoing procedure. • Checklists implemented.	Operator
Evaluation against Performance Indicators: No Impact for the MP Best practice noise minimisation measures such as installation of mufflers on plant and equipment, installation of sound rated ventilation filters, ensuring all sound rated doors are closed during operation, installation of quiet exciters on vibrating screen etc. have all been implemented and are effective. Noise levels assessed under *AS1055.1-1997 Acoustics-Description and Measurement of Environmental Noise* and relevant legislation and guidelines. No complaints received in relation to noise issues. Noise levels monitored during the noise study were well within the NSW EPA License acceptable sound levels.			
SUBPLAN B5: TRAFFIC AND AIR QUALITY MANAGEMENT PLAN			
5.1	Employ traffic controller(s) in instances where activities may cause undue congestion.	• Not required during this MP.	Operator
5.2	Traffic Route	• Reference Only - Only one traffic route is available for access to site at Letitia Spit.	Operator
5.3	Dust suppression measures	• No specific dust suppression required on site. • Access to the site via unsealed Letitia Road, Driving behaviours of site staff and subcontractors are monitored to avoid excessive dust generation. • Unable to limit public use of road generating large levels of dust.	
5.4	Maintain / Upgrade Letitia Road	• The condition of Letitia Road is an ongoing problem. TRESBC depends on the maintenance of the road for staff and suppliers to safely access the site and has been actively involved in seeking solutions for the improvement of the road.	Operator / TSC / Governments
4.5	Provide the community with adequate pre-warning of street disruptions.	• No street disruptions over this MP.	Operator

Task No.	Requirement	Status	Action By Whom
5.6	Procedures to be implemented should any damage to access roads occur as a result of system operation traffic	• No damage occurred as a result of operations	Operator
5.7	Record all consultation and outcomes of such consultation carried out during the preparation and implementation of the EMP in the Consultation Register.	• All records maintained on site.	Operator
5.8	Ensure vehicles are fitted with adequate exhaust control measures.	• Vehicles inspected and maintained daily / weekly. • Major inspections every 12 months.	Operator / Subcontractor
5.9	Cover temporary spoil heaps and stockpiles where necessary.	• Not required for MP	Operator
5.10	Enforce the covering of trucks transporting earth and fill materials as required.	• Not required for MP	Operator
5.11	Undertake revegetation of disturbed areas.	• Revegetation of disturbed areas in the general area of the sand bypass facility compound, access ways, and pipeline corridors, undertaken. Refer also to sub plan B10, task Item 4.2 & 5.1 (xii)	Operator

Evaluation against Performance Indicators:

All MCD site vehicles are regularly serviced to ensure compliance with relevant QLD and NSW statutory requirements.

No dust generated on site for the MP.

TSC maintained Letitia Road in poor state with large amounts of dust generated creating hazardous conditions.

No complaints received with regards to site based traffic and/or air quality issues.

SUBPLAN B6: SAND AND WATER QUALITY MANAGEMENT PLAN

6.1	Prepare and submit to QEPA the monitoring, sampling, and reporting methods for the monitoring of sand and water quality for approval.	• Approval was provided by the QEPA on 15 March 2001.	Operator Governments
6.2	Brief staff in the requirements of implementing this plan.	• All employees working on site have been inducted in the provisions of this plan. New staff briefed as required.	Operator

Task No.	Requirement	Status	Action By Whom
6.3	Install and maintain a vibrating screen above the slurry pit for the removal of debris.	• Vibrating screen operated and maintained in accordance with the procedures contained within the Operation and Maintenance Manual. Currently screen aperture of 30mm x 60mm in use. A new vibrating screen was installed in December 2012.	Operator
6.4	Dispose of debris removed by the vibrating screen.	• Debris removed and recycled or disposed off-site by waste removalists.	Operator / Subcontractor
6.5	Establish communication link with Tweed Shire Council to be notified of a high pollution incident in the Tweed River likely to affect water at the Low-Pressure Pump Station.	• Communication link during this period through Mr. Rodney Keevers and Ms Jane Lofthouse of the Tweed Shire Council • No pollution notices for MP	Operator/ TSC
6.6	Accidental spillage management	• No incident to report.	Operator
6.7	Following a flood event in the Tweed River or in the event of becoming aware of a pollution incident or high turbidity in the Tweed River, notify Governments of the situation and arrange alternative sand delivery if required.	• Not required during the MP	Operator / Governments
6.8	Conduct a Sand and Water Quality Monitoring Program during the first three months of operations.	• Completed.	Operator
6.9	After the first three months of operations, conduct a Sand and Water Quality Monitoring Program for the duration of the operation period.	• Sand and Water Quality Monitoring Program ongoing. All reports during the past 12-month MP indicate compliance with sand and water criteria. Refer Appendix A.	Operator
6.10	If results of sand or water quality monitoring results indicate that the dredged material is not Sand Material or poor water quality, inform and carry out directions of Governments.	• No incident to report.	Operator Dredge Operator
6.11	If turbidity plume is negatively affecting beach users, re-direct discharge to Snapper Rocks East in accordance with Sub-Plan B3.	• Compliant	Operator
6.12	Supplementary Dredging - Brief staff in the requirements of implementing this plan.	• All employees working on site have been inducted in the provisions of this plan.	Operator

Task No.	Requirement	Status	Action By Whom
6.13	Undertake fulltime visual inspection of dredge loads to check the visual characteristics of dredged and placed material.	• Turbidity and Plume monitoring carried out during dredging works.	Operator / Dredge Operator
6.14	Conduct a Sand and Water Quality Monitoring Program during each dredging campaign.	• Testing carried out in accordance with the EPL	Dredge Operator
6.15	Conduct a Sand and Water Quality Monitoring Program during each dredging campaign.	• Testing carried out in accordance with the EPL	Dredge Operator
6.16	Immediately inform Governments if the results of visual inspection or weekly sediment monitoring results indicate that the dredged material is not Sand Material.	• No incident to report.	Dredge Operator
6.17	Verify sediment and water quality monitoring results to register compliance.	• Testing carried out in accordance with the EPL	Dredge Operator Operator
6.18	Following a flood event in the Tweed River, notify Governments of the situation and arrange to discharge to East Snapper Rocks if required.	• No requirement to redirect discharge to East Snapper Rocks following any flood event during this period.	Operator

Evaluation against Performance Indicators:

Sand and water quality testing results indicate compliance with the performance criteria set out in this sub plan. Refer - APPENDIX A - PUMPED SAND AND WATER QUALITY MONITORING

Water quality testing from settling pit overflow discharge point indicates compliance with NSW EPA license conditions.

Water quality testing from sand delivery line shows no detectable grease/oils.

No complaints received concerning sand and water quality issues.

SUBPLAN B7: INFRASTRUCTURE AND PUBLIC ACCESS MANAGEMENT PLAN

7.1	Provide suitable safety signage at the discharge outlets.	• Signage installed at outlets during construction. • Outlet and jetty signage inspected daily. • Any vandalised signs repaired or replaced.	Operator
7.2	Monitor and maintain all equipment such as fencing, signage, lighting etc for the safety of persons in the vicinity of the works.	• Monitoring and maintenance ongoing. • Main jetty gates have been modified to minimise unauthorized access. • No vandalism to report for MP	Operator

Task No.	Requirement	Status	Action By Whom
7.3	Inform the public of any disruptions to public services.	• No disruptions or planned disruptions during this period.	Operator/Government
7.4	Direct on-site lighting away from residences.	• Undertaken prior to operations.	Operator
7.5	Maintain structures using materials and colours as determined as a result of consultation during the construction period.	• Maintenance works are all in accordance with the Operation and Maintenance Manual.	Operator
7.8	Refuse public entry to site unless under consent from Governments and Operations Manager.	• All staff informed.	Operator
7.9	All visitors to site to report to the site office.	• All visitors inducted upon entering site and induction records maintained.	Operator
7.10	Maintain hazard warning lights and sirens at each discharge outlet to warn beach users that the system is in operation.	• Warning system maintained, monitored and tested regularly by TRESBC staff in accordance with O & M Manual. Siren has been removed due to noise issues at night. Security staff in place when pumping to temporary outlets	Operator
7.12	Manage sand discharge at the Kirra outlet to minimise potential blockage of the stormwater outlet in the immediate vicinity.	• No pumping to Kirra required during this period.	Operator / GCCC
7.13	Store temporary pipe and construction plant at the Letitia Spit compound when not assembled at either of the temporary outlets.	• Temporary pipe stored at Letitia Spit compound.	Operator
Evaluation against Performance Indicators: No complaints received concerning safety signage adequacy. No injury caused to public as a result of the works. Pumping to upper beach areas requires supervision/security to ensure public stay clear of outlet. Some unauthorised access has been detected on the main jetty.			
SUB PLAN B8: WASTE MANAGEMENT PLAN			
8.1	In the event of waste spillage refer to procedures in EMP Operations Sub-Plan B12 Accident and Emergency Response.	• No incident to report.	Operator
8.2	Waste oil to be collected in drums and transported off site for recycling where possible.	• Small quantity of waste oil collected and stored on-site following servicing of plant. The Operator disposes of the waste oil at Stotts Creek waste disposal site.	Operator / Subcontractor

Task No.	Requirement	Status	Action By Whom
8.3	Petroleum products to be stored, handled, separated and signed as required by the AS1940 Storage and Handling of Flammable and Combustible Liquids.	• All dangerous goods stored correctly on site. • SDS maintained for a chemicals and products used on site.	Operator
8.4	Chemicals should be stored in a secure, well-ventilated room with adequate signage warning of hazardous substances.	• Compliant	Operator
8.5	Metals will be segregated and recycled.	• Compliant	Operator / Subcontractor
8.6	Glass and aluminium will be segregated and recycled.	• Compliant	Operator / Subcontractor
8.7	Cardboard/paper will be segregated, re-used and recycled.	• Compliant	Operator / Subcontractor
8.8	Green waste will be mulched and stored on-site and re-used for landscaping purposes.	• Green waste re-used on site when possible and practical.	Operator / Subcontractor
8.9	Minimal regulated wastes (e.g. oil) are generated from the operation of the system.	• Compliant	Operator / Subcontractor
8.10	Recycling bins and containers will be provided as needed.	• Compliant	Subcontractor
8.11	Soil contaminated through oil leakage to be bioremediated and disposed of by qualified contractor.	• No contamination incident to report.	Operator
8.12	Disposal of domestic non-recyclable and debris removed by the vibrating screen waste to Council approved waste disposal facility.	• Compliant	Subcontractor
8.13	All personnel, sub-contractors or suppliers working on site to be advised of the Operator's policy to minimise waste and the associated procedures to be followed.	• Compliant	Operator / Subcontractor
8.14	Debris removed by the vibrating screen is to be disposed of at a waste disposal facility.	• Compliant See 8.12	Operator / Subcontractor

Task No.	Requirement	Status	Action By Whom
8.15	Wastewater and Greywater managed and used for irrigation where possible	• Compliant	Operator / Subcontractor
Evaluation against Performance Indicators: All chemicals and paints have been stored and handled in accordance with NSW Dangerous Goods Regulations 1975, relevant Australian Standards and Work Cover requirements. Unnecessary generation of waste has been prevented through measures including proper planning and purchasing methods and plant modifications. All wastes have been recycled where practical. All wastes are collected and disposed of by subcontracted waste disposalists. Correct waste management practices have ensured no adverse impacts on land and water resources.			
SUBPLAN B10: LANDSCAPE MANAGEMENT PLAN			
10.1	Prepare plan in consultation with Tweed Shire Council and Gold Coast City Council. (CoGC)	• This Plan, which includes the Dune Management Strategy and species listing for the revegetation plan, has been prepared in consultation with CoGC, TSC, Fingal Dune Care, and two regional DLWC offices.	Governments Operator
10.2	Use plant species from the list contained in Sub plan B10 Appendix A for revegetation.	• Revegetation of cleared construction areas in the general area of the sand bypassing compound complete. All revegetation in accordance with Sub plan B10 Appendix A.	Operator
10.3	Source plants from local seed stock where possible	• Compliant	Operator
10.4	Use herbicides as necessary to control weed growth in disturbed areas.	• Compliant	Operator
10.5	Maintain all areas on-site that were revegetated during construction works.	• Compliant	Operator
10.6	Consult Coastal Dune Management (1990) by the Soil Conservation Service of NSW for dune stabilisation measures.	• Referenced as required	Operator
10.7	Maintain mulched walkway alongside jetty for internal access only.	• Compliant	Operator
10.8	Maintain security perimeter fencing.	• Compliant	Operator

<table>
<tr><th>Task No.</th><th>Requirement</th><th>Status</th><th>Action By Whom</th></tr>
<tr><td>10.9</td><td>Discourage introduced fauna to site through the correct disposal of waste.</td><td>• Compliant</td><td>Operator</td></tr>
<tr><td>10.10</td><td>Use standard soil and erosion control measures (including temporary mulching) to prevent impacts upon exposed areas.</td><td>• Measures implemented to stabilise exposed dunes after re-shaping works.</td><td>Operator</td></tr>
<tr><td colspan="4">10.3.1 Management of Shoreline Recession (Dune Management)</td></tr>
<tr><td colspan="4">The EIS/IAS Section 8.3.2.8 predicts that as a result of operation of the system, long term beach recession will occur along the northern section of Letitia Spit in the general vicinity of a jetty based bypassing system. A maximum long-term shoreline retreat of the order of 90 metres plus the normal fluctuations in high water mark of up to 50 – 80 metres due to storm erosion and accretion is anticipated. This retreat is expected to progressively occur over a period of 2-5 years.</td></tr>
<tr><td>10.3.1 (i)</td><td>Limit general foreshore alignment retreat due to long-term beach recession along Letitia Spit to a maximum of 90 m in the vicinity of the works.</td><td>• Revised
• Daily visual monitoring of shoreline ongoing.
• Plant operation to promote the growth of the beach local to the jetty.
• Foreshore alignment retreat was limited to about 90m in the vicinity of the jetty over this MP.
• Surveys during this MP show stable sand volumes along Letitia Spit.
• Refer also Sub plan B10, task item 5.1 (iii).</td><td>Operator</td></tr>
<tr><td>10.3.1 (ii)</td><td>Comply with maximum depth of sand removal for Compartment B.</td><td>• No longer monitoring the area defined as Western Boundary Compartment B.
• Revised Letitia monitoring program as recommended in “Letitia Beach Behaviour Report” (Feb 2022), and “Technical Note” (July2022)</td><td>Operator</td></tr>
<tr><td>10.3.1 (iii)</td><td>Limit significant disturbance to Letitia Spit upper and back beach areas to within 1000m of the southern training wall.</td><td>• Daily visual monitoring of shoreline ongoing.
• Plant operation to promote the growth of the beach local to the jetty.
• Surveys during this MP show stable sand volumes along Letitia Spit.
• Back passing by dredge undertaken to better manage volumes delivered to Queensland and to assist in the progradation of Letitia Beach.
<table>
<tr><th>Location</th><th>Quantity – m3</th></tr>
<tr><td>Fingal</td><td>10,975</td></tr>
<tr><td>Dreamtime</td><td>31,084</td></tr>
</table>
• Refer also Sub plan B10, task item 5.1 (i).</td><td>Operator</td></tr>
</table>

Task No.	Requirement	Status	Action By Whom
10.3.1 (iv)	Undertake removal of trees and shrubs within the predicted recession area (Compartment B) as necessary to prevent woody debris from entering and potentially blocking the system.	• Undertaken as required by front end Loader. • Visual monitoring performed daily. • No longer monitoring the area defined as Western Boundary Compartment B. • Revised Letitia monitoring program as recommended in "Letitia Beach Behaviour Report" (Feb 2022), and "Technical Note" (July2022)	Operator
10.3.1 (v)	In conjunction with the above task progressively undertake works as required to establish an appropriately vegetated dune at the landward edge of Compartment B and to minimise the potential for wind erosion of the upper beach. This work may include the mechanical handling of sand material into the Jetty sand trap where appropriate.	• All dunes are sufficiently covered by native vegetation	Operator
10.3.1 (vi)	Progressively reshape the new fore-dune area to match the dimensions of surrounding dunes.	• No reconstruction required during this period	Operator / Subcontractor
10.3.1 (vii)	Mulch all vegetation removed as a result of the above action items and store on site to be spread over re-worked areas.	• Cleared vegetation re-used for stabilisation of new dunes where practical and possible.	Operator
10.3.1 (viii)	Maintain a sufficient berm area to permit normal coastal processes, i.e. the toe of the dune should not encroach onto the beach berm.	• No reconstruction required during this period	Operator
10.3.1 (ix)	The reconstructed dune should have an aerodynamically stable shape with a seaward slope of 1V: 5H or flatter. The flatness of the slope helps moisture retention and therefore vegetation.	• No reconstruction required during this period	Operator
10.3.1 (x)	The seaward face of the reconstructed fore-dune should be flat to slightly convex in shape.	• No reconstruction required during this period.	Operator / Subcontractor
10.3.1 (xi)	Revegetate new fore and hind dune areas as required using primary and secondary species.	• No revegetation required during the MP.	Operator

Task No.	Requirement	Status	Action By Whom
10.3.1 (xii)	Install temporary wind screening fences to prevent wind erosion and traffic damage to dunes during revegetation works until plants are well established and dunes are stabilised.	• Will be used when required.	Operator
10.3.1 (xiii)	Control weed growth from all disturbed re-worked areas as per Task 4.4 and 4.5.	• Weed growth controlled as per 4.4 & 4.5.	Operator
10.3.1 (xiv)	Use selected plant species for revegetation works.	• Revegetation occurred in accordance with Sub plan B10 Appendix A.	Operator
10.3.1 (xv)	Undertake quarterly beach profile survey to monitor extent of localised long-term beach recession.	• Ongoing procedure with quarterly Surveys. Regular Surveys are supplemented by the Control Volume Surveys	Operator / Subcontractor
10.3.1 (xvi)	Undertake visual observation of beach changes relative to the fixed survey sight poles.	• Daily visual observations made and measured. Monthly results forwarded to Governments.	Operator
3.1.2	**Management of Localised Recession that extends beyond Compartment B in the immediate vicinity of the Jetty.**		
• The Concession Agreement allows the System to remove sand from below the 1960 seabed removal limit and exceed the side slopes specified for Compartment B in the vicinity of the Jetty. Localised long-term beach recession in the immediate proximity of the fixed bypassing system jetty may extend landward of the western boundary of Compartment B in this location, subject to the following management measures additional to those above. Note: No longer monitoring the area defined as Western Boundary Compartment B. Revised Letitia monitoring program as recommended in “Letitia Beach Behaviour Report” (Feb 2022), and “Technical Note” (July2022)			
10.3.1.2 (i)	Maintain a dune system in the immediate vicinity of the Jetty with appropriate dimensions to accommodate severe storm erosion and to ensure that the retreat of the upper beach does not reach the western boundary of the Tweed Bar and Entrance Area.	• Maintaining and monitoring dune system.	Operator

Task No.	Requirement	Status	Action By Whom
Evaluation against Performance Indicators: Weed infestation controlled on site. Plant growth satisfactory for this period. Revegetation providing a visual barrier to the compound. A continuous dune system was maintained throughout the MP. Refer Appendix D for photographic records. The observed recession generally reduces in extent further south of the jetty along central Letitia Spit beach. Localised beach retreat is up to about 90m and has been relatively stable over this MP. Note: No longer monitoring the area defined as Western Boundary Compartment B - Revised Letitia monitoring program as recommended in "Letitia Beach Behaviour Report" (Feb 2022), and "Technical Note" (July2022)			
SUB PLAN B11: HISTORIC SHIPWRECK MANAGEMENT PLAN			
11.1	Brief staff and contractors on known/ potential locations of shipwreck/relic sites. Reporting process and procedures	• Staff induction carried out	Operator/ Dredge Operator / Subcontractor
11.2	In the event of the discovery - Work is to stop immediately in this area, as continued work would constitute an excavation.	• No relics discovered this period.	Operator/ Dredge Operator / Subcontractor
11.3	In the event of the discovery - Notification should be made immediately to the NSW Heritage Office	• No relics discovered this period.	Operator/ Dredge Operator / Subcontractor
11.4	Complete the Shipwreck Notification form	• No relics discovered this period.	Operator/ Dredge Operator / Subcontractor

Task No.	Requirement	Status	Action By Whom
11.5	Do not touch the relics unless it is considered they are under threat. If material has been recovered inadvertently then this should be placed in a secure and wet environment subject to advice from the NSW Heritage Office.	• No relics discovered this period.	Operator/ Dredge Operator / Subcontractor
11.6	The site should be adequately protected from any unwarranted interference.	• No relics discovered this period.	Operator/ Dredge Operator / Subcontractor
11.7	Restrict entry through the use of barriers or taping off of the area or through any other effective means.	• No relics discovered this period.	Operator/ Dredge Operator / Subcontractor
11.8	No further work should be carried out in this area until further advice from the NSW Heritage Office.	• No relics discovered this period.	Operator/ Dredge Operator / Subcontractor
11.9	Engage services of a qualified Maritime Archaeologist to assess the site of the relic.	• No relics discovered this period.	Operator/ Dredge Operator / Subcontractor
11.10	Report the discovery of a shipwreck to the receiver of Wreck.	• No relics discovered this period.	Operator
Evaluation against Performance Indicators: All staff inducted in procedures to follow in the case of discovering potential shipwreck on site.			
SUB PLAN B12: ACCIDENT AND EMERGENCY RESPONSE PLAN			
12.1	Train staff, including subcontractors, in the requirements of this plan and response procedures.	• Compliant. • Emergency Response and Occupational Health and Safety Plans are covered during the induction training program for new staff and subcontractors.	Operator

Task No.	Requirement	Status	Action By Whom
12.2	Collect and maintain MSDS's for all hazardous materials used.	• Compliant. • Safety Data Sheets (SDS) kept electronically at site office and hard copies where the chemicals are stored. • All suppliers informed that SDS must be supplied upon delivery / introduction of new materials on site.	Operator
12.3	Supply correct personal protective equipment to any employees handling Dangerous Goods.	• Compliant	Operator
12.4	Maintain spill response kit, and other emergency equipment.	• Spill response kits maintained on site. Maintenance and daily checks performed by Subcontractors and Operations staff. • All emergency exit lights tested and maintained by Electrical subcontractor and personnel on site. • All fire extinguishers tested and certified by Wormald Fire Systems.	Operator
12.5	In the event of an environmental emergency, follow the Emergency Response Plan kept as part of the Project Occupational Health Safety and Rehabilitation Plan.	• Dredge Incident reported to AMSA, NSW EPA and QEPA – 26 May 23. Bio degradable hydraulic fluid leak from ram <50l	Operator
12.6	Notify and report NSW and QEPA of spill causing environmental harm.	• No incidents to report.	Operator
12.7	Monitor the affected area to ensure that all contaminated material has been removed and properly disposed of.	• Spill response kits maintained on site. Maintenance and daily checks performed by Subcontractors and Operations staff. • No incidents to report.	Operator
12.8	Contaminated clean up materials, included any contaminated soil will be collected and disposed of by a suitably qualified contractor.	• Spill response kits maintained on site. Maintenance and daily checks performed by Subcontractors and Operations staff. •	Operator
12.9	Fill out NCR form and record corrective action taken	• No incidents to report	Operator
12.10	All personnel on-site, including contractors and subcontractors must receive Induction Training, outlining the requirements of the: Emergency Response Plan, containing the Shipboard Oil Pollution Emergency Plan, Occupational Health, Safety and Rehabilitation Plan and procedures to be followed.	• Compliant	Operator

Task No.	Requirement	Status	Action By Whom
12.11	Collect and maintain SDS for all hazardous materials used or stored on site	• Compliant.	Operator
12.12	Have Spill Response Kit, fire extinguishers and other emergency response equipment fully maintained and readily available.	• Spill response kits maintained on site. Maintenance and daily checks performed by Subcontractors and Operations staff. • All emergency exit lights tested and maintained by Electrical subcontractor and personnel on site. • All fire extinguishers tested and certified by Wormald Fire Systems.	Operator
12.13	Supply correct personal protective equipment to any employees that may handle Dangerous Goods.	• PPE Supplied and staff trained in use	Operator
12.14	Notify the Manager and appropriate authorities in the event of a major spill or where environmental harm has occurred.	• No incidents to report	Operator
12.15	In the event of an environmental emergency, follow the Emergency Response Plan kept as part of the OHS&R Plan	• No incidents to report	Operator
12.16	Check safety procedures are implemented correctly and correct PPE worn. Monitor the affected area to ensure that all contaminated clean-up materials have been removed and properly disposed of.	• No incidents to report	Operator

Evaluation against Performance Indicators:

Dangerous Goods correctly stored and handled on site according to NSW Dangerous Goods Act and regulations and relevant Australian Standards.

A register of hazardous materials and their Material Safety Data Sheets is kept on site in a central location for all hazardous materials used or stored on site.

7. SUPPLEMENTARY DREDGING

- Dredging operations were undertaken during the current MP.
- Dredging was carried out under the guidance of the Dredge Management Plan (DMP) The DMP details the removal design and the placement locations and volumes.
- Dredging occurred from 11 June 2023 to 1 October 2023.
- TRESBC holds the EML for these activities and carries out the required testing and record keeping complying with the EPA guidelines.

Placement Locations and Totals

Date	Dreamtime	Fingal	Duranbah	Snapper East	2A South
11/06/2023	0	0	0	2,172	0
12/06/2023	0	0	0	8,469	938
13/06/2023	0	0	0	0	1,692
14/06/2023	0	0	0	0	7,728
15/06/2023	0	0	0	0	7,618
16/06/2023	0	0	0	0	8,009
17/06/2023	0	0	0	0	7,037
18/06/2023	0	0	0	0	7,876
20/06/2023	0	10,863	0	0	0
21/06/2023	0	6,242	0	0	0
22/06/2023	0	10,145	0	0	0
23/06/2023	0	3,834	0	4,540	0
15/09/2023	0	0	0	3,914	0
16/09/2023	0	0	0	2,108	1,035
17/09/2023	0	0	0	2,677	849
18/09/2023	2,354	0	0	0	1,007
19/09/2023	1,059	0	0	0	846
20/09/2023	1,874	0	0	0	0
21/09/2023	1,592	0	0	0	0
24/09/2023	3,860	0	0	259	0
25/09/2023	0	0	0	0	4,406
26/09/2023	0	0	0	0	1,495
28/09/2023	0	0	0	0	4,275
29/09/2023	0	0	0	0	7,038
30/09/2023	0	0	0	0	9,856
1/10/2023	236	0	0	0	9,023
Location Totals	10,975	31,084	0	24,139	80,728
Total	146,926				

8. ENVIRONMENTAL AUDIT

The following Audits were performed during this MP.

Environmental Audit covering the EMS performed by the EMR, Martin Ross in December 2023.
Internal WHS&E audit performed by WHS&E Manager in December 2023.

9. APPENDIX A - WATER QUALITY MONITORING

Discharge & Monitoring Point 1

Discharge and Monitoring, Discharge from concentrator to beach at Letitia Spit as shown on drawing fiqure 1 TRESBP EMP subplan B5 " Water Quality Sampling Locations Plan" sample location number 6 dated 14 April 2000.

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Oil and Grease	Visible	13	0	0	0	0
pH	pH	13	13	7.2	8.1	8.4
TSS (Wet)	milligrams per litre	13	13	2	24	142

Monitoring Point 3

Monitoring, Five hundred metres (500m) up current (away from the direction of the sediment plume) of the active dredge

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Turbidity	nephelometric turbidity units	26	26	0.25	1.11	5.45

Monitoring Point 4

Monitoring, Two hundred metres (200m) down current from the active dredge

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Turbidity	nephelometric turbidity units	26	26	0.20	1.05	5.10

Monitoring Point 5

Monitoring, Fifty metres (50m) down current from the dredge depositing sand at the Fingal Beach sand deposition area.

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Turbidity	nephelometric turbidity units	8	8	0.20	0.46	0.70

Monitoring Point 6

Monitoring, Fifty metres (50m) down current from the dredge depositing sand at the Dreamtime Beach sand deposition area.

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Turbidity	nephelometric turbidity units	8	8	0.20	0.48	0.85

Monitoring Point 7

Monitoring, Cook Island Aquatic Reserve

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Total suspended solids	milligrams per litre	1	1	2	2	2
Turbidity	nephelometric turbidity units	1	1	0.6	0.6	0.6

Discharge & Monitoring Point 1

Discharge and Monitoring, Discharge from concentrator to beach at Letitia Spit as shown on drawing fiqure 1 TRESBP EMP subplan B5 " Water Quality Sampling Locations Plan" sample location number 6 dated 14 April 2000.

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	Highest result
kilolitres per day	Daily	13	0.1	1838.8	12310.6

Discharge Point 2

Discharge, Discharge from the Trailing Suction Hopper Dredger at keel level

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	Highest result
megalitres per year	Daily	26	3636	36765	77160

10. APPENDIX C - MONTHLY VOLUMES OF SAND DELIVERED DURING THE MP – May 2023 – April 2024

Month	Volume	
	Snapper Rocks East	Duranbah
May 23	35,478	0
Jun-23	23,324	0
Jul-23	32,493	0
Aug-23	22,418	0
Sep-23	44,687	0
Oct-23	39,147	0
Nov-23	37,414	0
Dec-23	14,328	0
Jan-24	29,653	0
Feb-24	38,262	0
Mar-24	49,535	0
Apr-24	42,896	0
Total	409,635	0

11. APPENDIX D - PHOTOGRAPHS

PHOTOGRAPHIC RECORDS OF LETITIA DURING THE MONITORING PERIOD

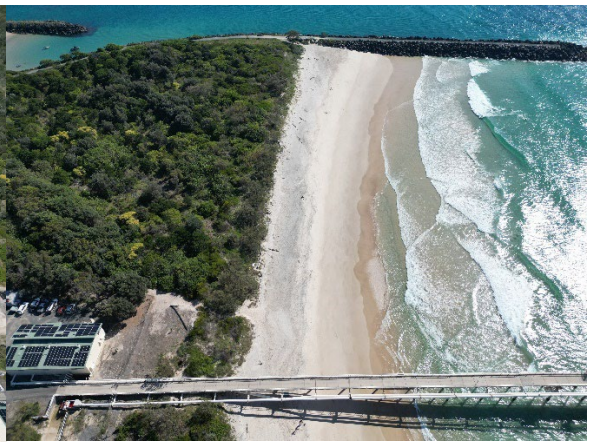
South - May 23

North – May 23

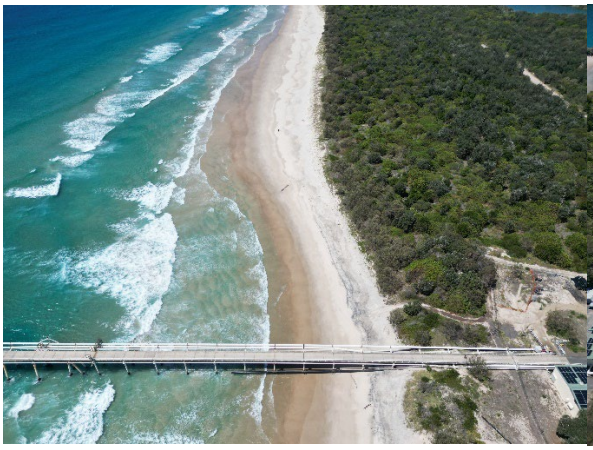
South – July 22

North – July 23

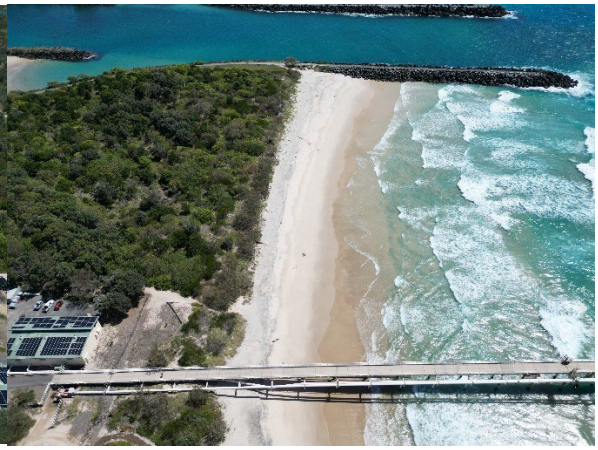
South – August 23



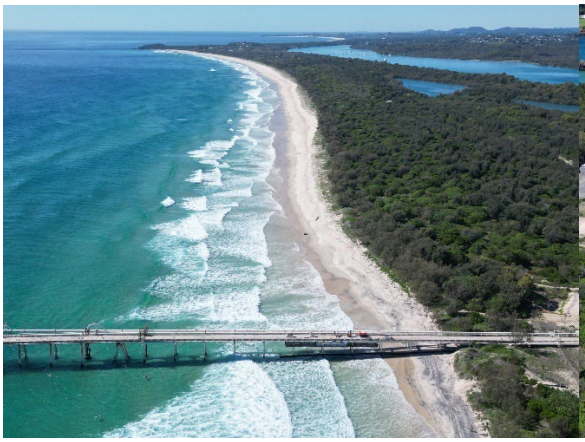
North – August 23



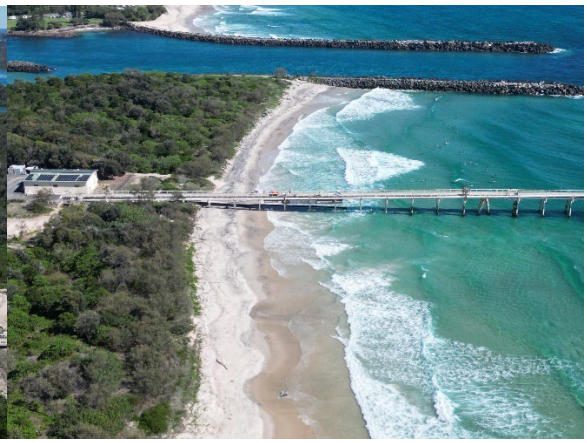
South – October 23



North - October 23



South – November 2023



North – November 2023

South – February 24

North – February 24

South – April 2024

North – April 24

Appendix G

Project Background

Tweed Sand Bypassing Project Background

Background

Tweed Sand Bypassing (TSB) is a joint initiative of the State Governments of New South Wales and Queensland ('the Governments'), to improve and maintain navigation conditions at the Tweed River entrance and to replenish and maintain a natural sand supply to the southern Gold Coast Beaches.

The project has been carried out in two stages:

- Stage 1 Initial Dredging and Nourishment Works (April 1995 to May 1998).
- Stage 2 Sand Bypassing System (May 2001 to present).

The objectives of the Project are to

- Establish and maintain a safe, navigable entrance to the Tweed River, and
- Restore and maintain the coastal sand drift to the southern Gold Coast beaches.

These objectives are set out in both the NSW and Qld legislation and are achieved in perpetuity through the use of the Jetty Mounted Pumping System (JMPS) and recurrent dredging. The project is managed by Transport for NSW (TfNSW) and the Queensland Department of Environment, Tourism, Science and Innovation (DETSI) on behalf of the Governments, with the financial support of the City of Gold Coast (CoGC) and in conjunction with Tweed Shire Council (TSC).

History and Need for the Project

Navigation of the Tweed River has historically been dangerous with the sand shoals around the entrance constantly moving and changing in response to the varying wave climates. During the early years of use, the Tweed River entrance claimed many lives as boats capsized or were shipwrecked while trying to gain access to the river.

Figure 1 Duranbah in the late 1950s before the Tweed River Entrance training walls were extended.

To control the sand shoal movement and improve navigation, training walls were constructed in the late 1890s, and then extended seaward by approximately 380 metres in the early 1960s. While improving navigation temporarily, the extension of the training walls trapped the natural longshore drift that was travelling northwards along Letitia Spit. This meant that the sand was unable to cross the Tweed River entrance bar and nourish the southern Gold Coast beaches in Queensland.

As a result, sand began to build up behind the southern training wall of the Tweed River entrance. Once the sand had built up to the end of the southern wall it began flowing around and into the Tweed River entrance, re-creating the bar that had historically been such a navigational hazard.

Due to the accumulation of sand on Letitia spit, there was very little sand available at the southern Gold Coast to replenish the beaches after storm activity. After two decades of stormy weather in the 1960s and 1970s, the beaches of the southern Gold Coast were severely eroded. The late 1970s to 1990s experienced fewer storm events, but erosion continued, as the sand supply that was able to replenish the beaches was still blocked by the training walls. This loss of sand impacted the protection of infrastructure, recreational activities, tourism and the local economy.

Figure 2 Eroded Kirra Beach in the late 1960s.

To address the issues created by extension of the Tweed River training walls, various sand nourishment campaigns via dredging were undertaken in the 1970's, 80s and 90s.

A more permanent solution was deemed necessary and in the early 1990's a Heads of Agreement was developed for Tweed Sand Bypassing between Qld and NSW governments. This was followed by a Deed of Agreement and subsequently the NSW Tweed River Entrance Sand Bypassing Project Agreement Act 1998 and the Qld Tweed River Entrance Sand Bypassing Project Agreement Act 1998.

An Environmental Impact Statement / Impact Assessment Study (EIS/IAS) for the project was prepared and publicly exhibited in accordance with the planning requirements of both States in 1997 (Hyder et al 1997). The former NSW Department of Land & Water Conservation (responsibilities for TSB since transferred to TfNSW) obtained environmental assessment concurrence in accordance with *the Queensland State Development and Public Works Organisation Act (1971-81)* and planning approval for the project pursuant to the *NSW Environmental Planning and Assessment Act, 1979* on behalf of the Governments in March and July 1998 respectively.

TSB was implemented in two stages. The first stage involved dredging from the Tweed River entrance and direct deposition of the sand on the southern Gold Coast beaches. In 1995-96 and 1998, 3 million cubic metres of sand was dredged from the river entrance and deposited on Rainbow Bay, Greenmount, Coolangatta, Kirra and North Kirra beaches.

The second stage of the project was installation and operation/maintenance of the JMPS. In December 1999 the NSW and Queensland State Governments entered into two agreements with McConnell Dowell Constructors Pty Ltd for the construction and operation of the facility:

- The development agreement to design and build the sand bypassing facility and;
- The concession agreement to operate the facility for 23 years after which it is handed back to the Governments.

Two Environmental Management Systems (EMSs) were developed for the project comprising an EMS-Delivery applicable to the construction and commissioning phase of the system and the EMS-Operations which is currently in place and applies to the operational phase.

The EMS-Delivery was implemented from February 2000 to May 2001. Monitoring outcomes for the EMS-Delivery are presented in the project's environmental monitoring reports for the Delivery Period (Report No. DA-01 to DA-05).

The EMS-Operations were developed by TRESBCo and the Governments to satisfy the environmental management requirements for Stage 2 of the project arising out of the EIS/ IAS for the project:

- Conditions of the EP&A Act approval;
- Recommendations of the Queensland Impact Assessment Review Report.

The EMS-Operations consists of an EMP-Operations and associated sub-plans that deal with significant environmental aspects.

On 4 May 2001 sand bypassing commenced.

Description and Location

The project area of TSB is located on the border of New South Wales and Queensland, approximately 100 km south of Brisbane and 900 km north of Sydney. It falls into the jurisdictions of both the City of Gold Coast and Tweed Shire Council.

TSB consists of a Jetty Mounted Pumping System (JMPS) and regular dredging of the Tweed River entrance via a floating dredge vessel.

The JMPS comprises **of**:

- A sand collection jetty, pumps and control building at the northern end of Letitia Spit, about 250 m south of the southern Tweed River breakwater (refer to Figure 1).
- A clean water low pressure pump station mounted on a short jetty (intake Jetty) on the southern river training wall at the northern end of Letitia Spit (refer to Figure 1).
- A compound area at the landward end of the sand collection jetty for the housing of a control building and workshop, and sand slurry collection pit (refer to Figures 1 & 3).
- A sand delivery pipeline that crosses under the Tweed River about 250 m downstream of Jack Evans Boat harbour (refer to Figure 3 & 4).
- Sand delivery outlets at Snapper Rocks East, Snapper Rocks West, Duranbah, Greenmount and Kirra Point (refer Figure 4).

The JMPS has an overall length of 450 metres constructed perpendicular to the Letitia Spit beach. The jetty supports 10 submersible jet pumps that sit below the seabed and collect the sand that is naturally transported towards them. The collected sand is then transported via an underground pipeline network to a chosen sand delivery outlet.

Figure 3 Aerial Photographs of Project Site, TSB system and locality (photo: October 2022)

Figure 4 Aerial Photographs of Project Site, southern Gold Coast beaches (photo: October 2022)

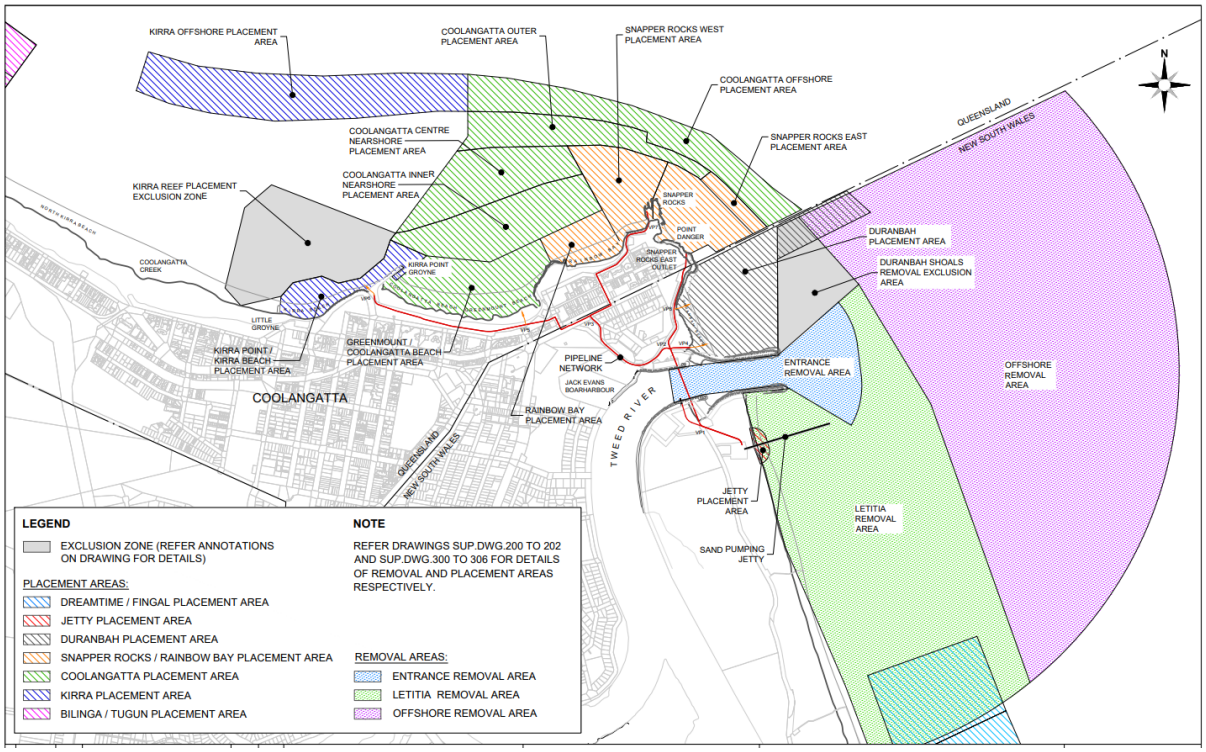


Figure 5 Project Locality Plan (TRESBP)

Figure 6 Location of TSB pumping outlets (TRESBP)

Purpose and Benefits

The purpose of TSB is to collect the sand that is naturally transported northwards along Letitia Spit and place it north of the Tweed River after which it is naturally moved by waves and currents to nourish the southern Gold Coast beaches.

The system is designed to collect and deliver an average of about 500,000 m³ of sand each year under normal operation. It also has the reserve capacity to deliver at higher rates when sand drift rates are elevated, such as during storms.

The majority of sand collected by the jetty system is delivered to the primary outlet point of Snapper Rocks East. To provide flexibility, intermittent discharge outlets have also been established at Duranbah Beach, Greenmount Beach, Snapper Rocks West and Kirra Point (Figure 3).

The bypassing system is not able to intercept 100% of the coastal sand drift making its way to the Tweed River Entrance, and it may not be possible to maintain a clear navigation channel all of the time using the bypassing system alone. Outflanking of and leakage through the jetty during severe storms and flooding of the Tweed River may deposit sand in the entrance area and compromise navigation conditions at times. Therefore, supplementary dredging to clear the Tweed River entrance is required.

Implementation of TSB provides a wide range of benefits to the local region. Maintaining a clear navigation channel at the mouth of the Tweed River improves navigability and safety for the commercial fishing fleet and other commercial and recreational vessels using the entrance. It also improves tidal flushing thus improving water quality in the lower Tweed estuary. Nourishment of the Gold Coast beaches assists in providing protection against storm erosion as well as maintaining beach amenity, beach safety and the consistency of surf conditions.

Statutory and other obligations

Legislation and Governance

Tweed Sand Bypassing operates under overarching legislation in both NSW and Qld, the enabling Acts known as the *Tweed River Entrance Sand Bypassing Act 1995* (NSW) and *Tweed River Entrance Sand Bypassing Agreement Act 1998 (*Qld).
The TSB Project Legislation provides the framework for the implementation of a unique joint agreement between the NSW and Qld governments (the Governments) in perpetuity and gives effect to the Heads of Agreement and a Deed of Agreement (both included as a schedule to the legislation).

The objectives of the Qld Act and the NSW Act are set out under the enabling Acts, and more generally are to improve and continually maintain:

-
- the navigability of the Tweed River entrance; and
- the amenity of southern Queensland beaches.

The intentions for the project and a high-level framework for the project are set out in the Heads of Agreement, and a more detailed framework provided under the Deed of Agreement.

Over the longer term, the Acts require a contract quantity of sand to be delivered to the Qld beaches (from the removal areas) which is equal to the Long Term Average (LTA) of net littoral drift and delivered in a way that is consistent with natural processes. The LTA is assessed independently (at least every 10 years). The Acts also require the Tweed River entrance is maintained to a certain depth and width (-3.5m ISLW and 70m wide) to allow navigability.

In each Act, NSW is nominated the coordinating State, while Qld is the reviewing State. Both governments have a Project Director, while NSW has a Project Manager who is responsible for the day to day coordination of TSB. The Project manager oversees a team of several NSW Government officers, while the Qld Project Director overseas Qld Government officers. The NSW and Qld teams work collaboratively to ensure the project objectives are achieved.

TSB has a Working Group which is made up of members Qld and NSW Governments as well as City of Gold Coast and Tweed Shire Council. The Working Group is responsible for strategic direction, financial control, policy setting, risk management and implementation responsibility.

The Advisory Committee is the primary mechanism for communications between the TSB team and the community. It is made up of two community members of each state as well as representatives from City of Gold Coast, Tweed Shire Council, and two representatives from each State Government. The Working Group meets four times each year.

Tweed River Entrance Sand Bypassing Company (TRESBCo - a subsidiary of McConnell Dowell Constructions) were responsible for the operation and maintenance of the sand bypassing system under a Concession Agreement up until September 2024. Since October 2024, NSW Government assumed direct responsibility for operation and management of TSB.

Concession Agreement

The sand bypass jetty system was commissioned on 4 May 2001 and was operated under the Concession Agreement between the Governments, Tweed River Entrance Sand Bypassing Company Pty Limited and the Guarantor. The Concession Agreement expired on 30 September 2024.

Intergovernmental Agreement

The Intergovernmental Agreement (IA) replaced the Concession Agreement from 1 October 2024 and is the head of power for the Tweed Sand Bypass Management System (TSBMS). The TSBMS structure is outlined in the figure below.

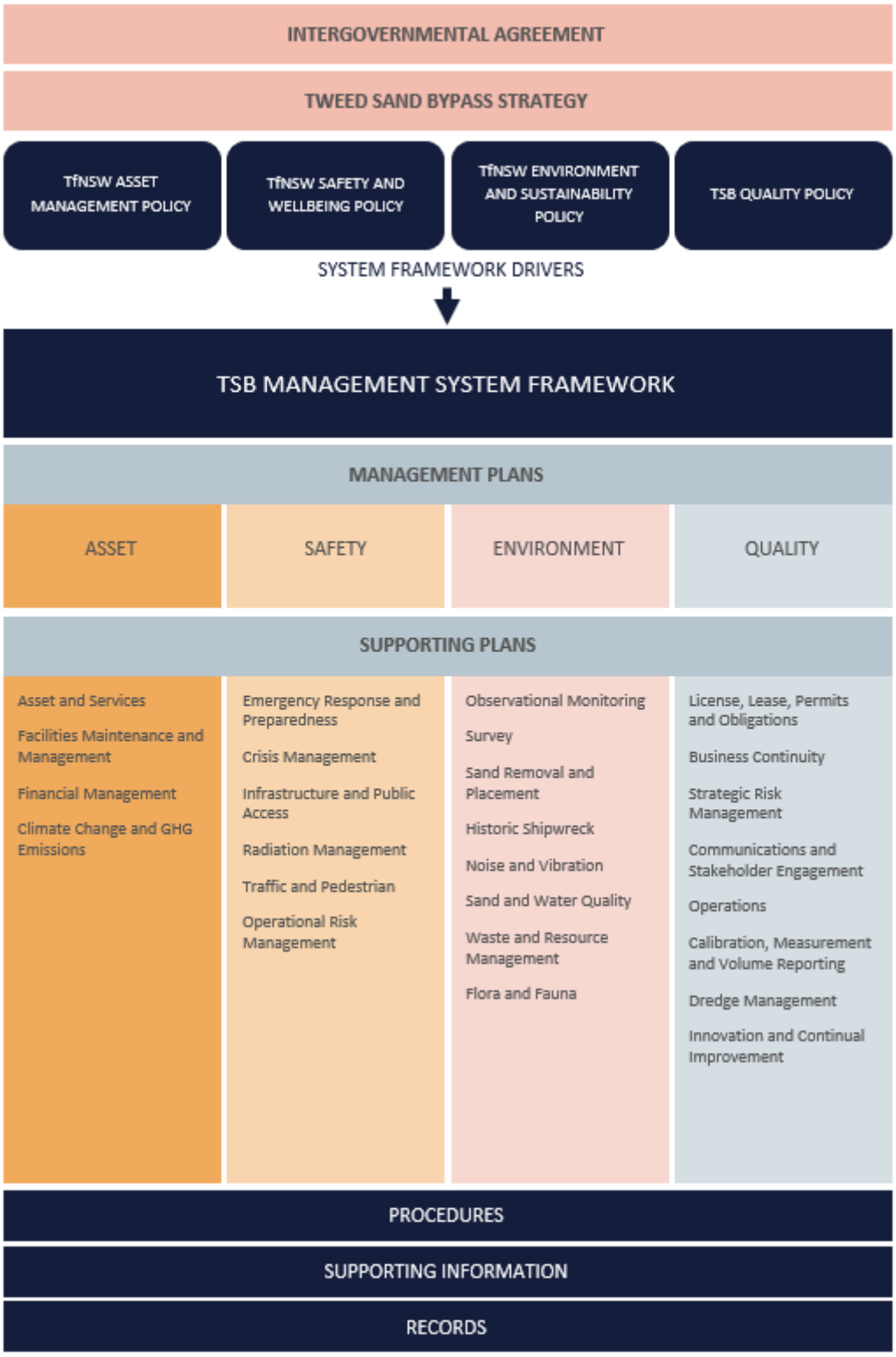


Figure 7 TSB Management System Structure

Environmental Management Framework

The TSB project operates under an environmental management framework which was developed based on the predictions set out in the original environmental impact statement/integrated assessment study (EIS/IAS) and overarching approval (application no. G94/00236) issued under the EP&A Act (NSW).

Framework pre October 2024

The framework for the EMS-Operations, which ceased 30 September 2024 at the end of the concession agreement, is outlined in Figure 7 below. The EMS-Operations document and sub-plans managed by TRESBCo were certified under the ISO14001 framework.

The EMS-Operations were approved by the former NSW Department of Urban Affairs and Planning (now DPIE) on 23 February 2001, and incorporated environmental management sub-plans (16 thereof) that addressed significant environmental aspects of the project. The EMPs specified the assignment of resources and responsibilities for achieving the environmental requirements and included detailed monitoring programs.

ENVIRONMENTAL MANAGEMENT SYSTEM – OPERATIONS *** managed by TRESBCo under ISO14001 certification*	
Environmental Management Plan – Operations Sub-plans	
Governments Sub-plans **managed and implemented by Governments	**TRESBCo Sub-plans** **managed and implemented by TRESBCo under ISO14001 certification.
B1 Consultation Strategy Plan	B2 Community Information Plan
B9 Letitia Spit Avifauna Habitat Management Plan	B3 Sand Retrieval and Placement Strategy
B13 Beach Management and Nourishment Strategy	B4 Noise and Vibration Management Plan
B14 Kirra Reef Management Plan	B5 Traffic and Air Quality Management Plan
B15 Duranbah Surf Quality & Beach Amenity Management Plan	B6 Sand and Water Quality Management Plan
B16 Tweed River Entrance & Lower Estuary Management Plan	B7 Infrastructure and Public Access Management Plan
	B8 Waste Management Plan
	B10 Landscaping Management Plan
	B11 Historic Shipwreck Management Plan
	B12 Accident and Emergency Response Plan

Figure 8 Structure TSB EMS-Operations (Pre October 2024)

Framework post October 2024

A new environmental management framework underwent stakeholder consultation in July 2024 and was submitted to the Department (DPHI) for approval in August 2024. The framework was approved by the Department in September 2024 and commenced 1 October 2024. The framework was developed in accordance with the TSB Management System in in **Figure 7** and is shown below in **Figure 9**.

Environmental Management Plan – Operations
Observational Monitoring Plan
Survey Plan
Sand Removal and Placement Plan
Historic Shipwreck Plan
Noise and Vibration Management Plan
Sand and Water Quality Management Plan
Waste and Resource Management
Flora and Fauna Management

Figure 9 Structure TSB EMP-Operations (Post October 2024)

Review of Environmental Factors (REF)

TSB currently operates in accordance with a Review of Environmental Factors (REF) assessment completed post approvals, as required under the EP&A Act. The following REF is in application:

- **Back-passing by Dredge** - back-passing of sand dredged from the Tweed River entrance. A maximum of 50,000m^3 of material per annum has been approved, with 30,000m^3 and 20,000m^3 allocated to Fingal and Dreamtime beaches respectively. The purpose is to enhance and maintain the attributes of the Gold Coast – Tweed Heads region and more specifically the Tweed River estuary and the southern Gold Coast beaches and to achieve the objectives of each State. A Project Environmental Management Plan (PEMP) is required to be developed and implemented by the principal works contractor, Tweed River Entrance Sand Bypassing Company Pty Ltd, that complies with the conditions of the REF.

Environmental Protection License

Tweed Sand Bypassing has transferred the Environmental Protection License (EPL no. 10432) for Extractive Activities (Activity Type: Water-based extractive activity) from Tweed River Entrance Sand Bypassing Company Pty Ltd. This license was amended to include the back-passing by dredge in 2019. The license was transferred to Transport for New South Wales on 1 October 2024.

Radiation License

Eleven nuclear density gauges are used at the Tweed Sand Bypassing site to measure slurry density.

In New South Wales, the use of radioactive materials and radiation apparatus is regulated by the Radiation Control Amendment Act 2010 No 91 and Protection from Harmful Radiation Act 1990 No 13. The NSW Environmental Protection Authority (EPA) is the administrator of the Act and Regulation. Applicable codes and guidelines for the use of fixed radiation gauges are:

- Australian Government – Australian Radiation Protection and Nuclear Safety Agency - Code of Practice and Safety Guide – Safe Use of Fixed Radiation Gauges https://www.arpansa.gov.au/sites/default/files/legacy/pubs/rps/rps13.pdf

- NSW EPA Radiation Guideline 3 – Recommendations for minimum standards and safety requirements for fixed radiation gauges (sealed source devices) https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/radiation/130731rg3fixedg.ashx

The eleven gauges at TSB are also licenced for use (with relevant conditions) under Licence Number 5061143 as issued by NSW EPA.

Operational Details

Jetty Construction

McConnell Dowell formed a project management team in late 1999 to undertake the management of the project. The team covered the core groups of engineering, procurement, accounts, project services, construction, health & safety and quality.

Construction commenced in March 2000 with the upgrade of the access road and preparation of the site.

Temporary structures needed for piling and constructing the jetty were designed in-house by McConnell Dowell. An 80T crane was mobilised and jetty onshore piling commenced in March 2000 followed by offshore piling in April 2000. Piling proceeded at a rate of one bent every two days. The jetty structure was laid concurrently and the jetty was completed late August 2000.

A series of 400mm polyurethane lined flanged steel pipelines totalling 2.1km in length were laid throughout developed and reserve land in the townships of Tweed Heads and Coolangatta. The use of flanged joints was necessary to prevent scouring erosion that could occur if other mechanical joints were used, however, this also necessitated accurate bending of over half the pipe spools to accommodate the curves in the pipeline route. To minimise disruption to the public, lane and road closures were carefully planned and managed and all open trenches were back-filled and compacted by the end of each day.

In order to minimise the diameter of the directional bore and guarantee the integrity of the pipe after the pull, McConnell Dowell selected the Macdow Pipe Coupling for joining the 12m urethane lined pipe spools in the under river pipeline section. This coupling enabled full penetration butt weld jointing of polyurethane lined pipes by conventional stovepipe welding techniques. In this project extensive stress analysis was performed to ensure the strength of the coupling would be suitable for the bending stresses incurred during pull pack through the directional drill bore.

The under river crossing involved a 400m long directional drill with a final bore size of 710mm. The bore accommodated the slurry pipeline and the high voltage electrical cable for power supply to the pumping station. Pipe stringing commenced in April 2000, the drilling contractor was mobilised in May and the pipe had been installed by August.

Construction of the pump station associated mechanical and electrical fit-out, site roads and landscaping were undertaken by numerous subcontractors co-ordinated by the project management team.

Construction and management were undertaken in accordance with the requirements of ISO 9001.

Jetty Mounted Pumping System

The sand collection jetty has an overall length of 450 metres, a working load limit close to 50T, a deck approximately 8m above the high tide level, which is constructed perpendicular to Letitia Spit beach, some 250 metres south of the tip of the southern breakwater. A sand trap is maintained under the jetty by the operation of a series of ten submerged jet pumps. The sand trap is maintained as a permanent depression under the sand collection jetty where natural processes feed sand into this sand trap from the from the natural littoral drift.

The system can operate with up to four (4) jet pumps operating at any one time, where the sand slurry picked up by the pumps is discharged into a flume and gravitated to a slurry pit located on shore. The discharge of each jet pump is monitored for slurry density, to enable the operating jet pumps to be switched as the sand supply at each jet pump is exhausted.

Water to operate the pumps is collected by a low-pressure pump station comprising one submersible pump (approx. 150KW) supported in the Tweed River upstream of the entrance on a steel piled trestle structure where water free from sand can be reliably obtained to reduce wear in the supply water pumping equipment. The low-pressure pump station has removable screens to prevent large items from being drawn into the pump's suction.

The low-pressure water is delivered to the control building by an underground 450mm MDPE low pressure pipeline to supply the high-pressure pump, the flume dilution pump and slurry pit. A single high-pressure pump driven by a variable speed motor supplies the high-pressure motive water for the jet pumps; the pump speed is adjustable to limit the maximum volume of sand delivered by the operating jet pumps to match the capacity of the sand transfer system.

The control system for the jet pumps automatically cycles through a predetermined series of jet pump operations to maintain the sand trap and maximise the sand delivery rate.

A screening device has been installed to prevent large items (shells, bricks, stones, etc) picked up by the jet pumps from reaching and blocking the sand transfer system. These items are collected in a separate waste bin and disposed of accordingly.

A slurry pit receives the sand slurry from the jet pumps and concentrates the sand slurry to the required density, depending on the outlet point. Surplus water from the slurry pit overflows through an underground 600mm diameter MDPE combined stormwater drain to the Letitia Spit beach.

The sand transfer system draws sand slurry from the slurry pit and pumps it through the 400mm diameter polyurethane lined steel slurry pipeline under the Tweed River to a chosen outlet between Duranbah and Kirra. The system can discharge to only one outlet at a time; the operating outlet being selected by the operator and set using locked valves along the slurry pipelines. The sand transfer system is driven by either one or two of the slurry pumps (each approx. 630kW) depending on the outlet location. These pumps are connected in series when delivering to the farthest outlets.

All large plant, except for the low-pressure water supply pump, is located within the controlled environment of the control building. This building also houses all electrical and control equipment, control room, maintenance facilities and staff amenities. An outside secure compound stores supplies including spare jet pumps and pipework including the MDPE pipe to be used for the temporary outlets.

A comprehensive computerised control system operates and supervises the operations of the fixed sand bypassing system. TSB is generally operated at night to take advantage of cheaper off-peak electricity and to minimise any disturbance caused by sand discharges to beach users.

Dredging

As well as pumping via the JMPS, TSB operations include dredging of the Tweed River entrance to maintain entrance navigability. Dredging is typically undertaken using a floating trailer suction hopper dredge.

Dredging of the entrance generally occurs each year and dredged sand is delivered to a number of approved deposition locations.

Nearshore placement zones from Dreamtime to Bilinga Beach have been established for the deposition of dredged sand (refer Figure 6). Typically, a volume of up to 200,000m^3 per dredge campaign is placed within these zones.

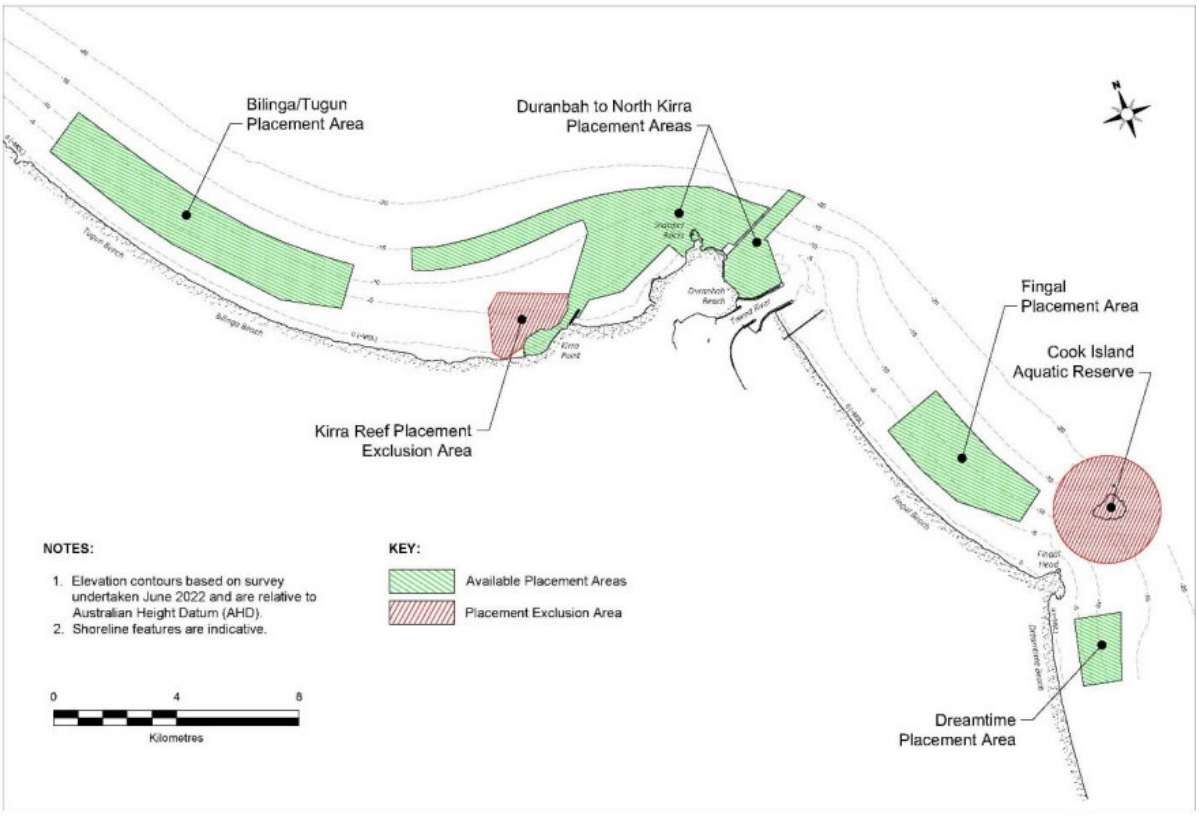


Figure 10 Dredge Placement Boxes (TRESBP)

Coastal Processes and TSB transport volumes

TSB aims to transfer a volume of sand which matches the natural littoral transport. The Long Term Average volume is calculated using previous metocean data and is reviewed at least every ten years. Since TSB commencement the LTA has remained at 500,000m^3 per year. The actual transported sand volume aims to stay within an acceptable deviation from the LTA. An illustration of the coastal processes (natural and interventional) are shown in the following Figure 10.

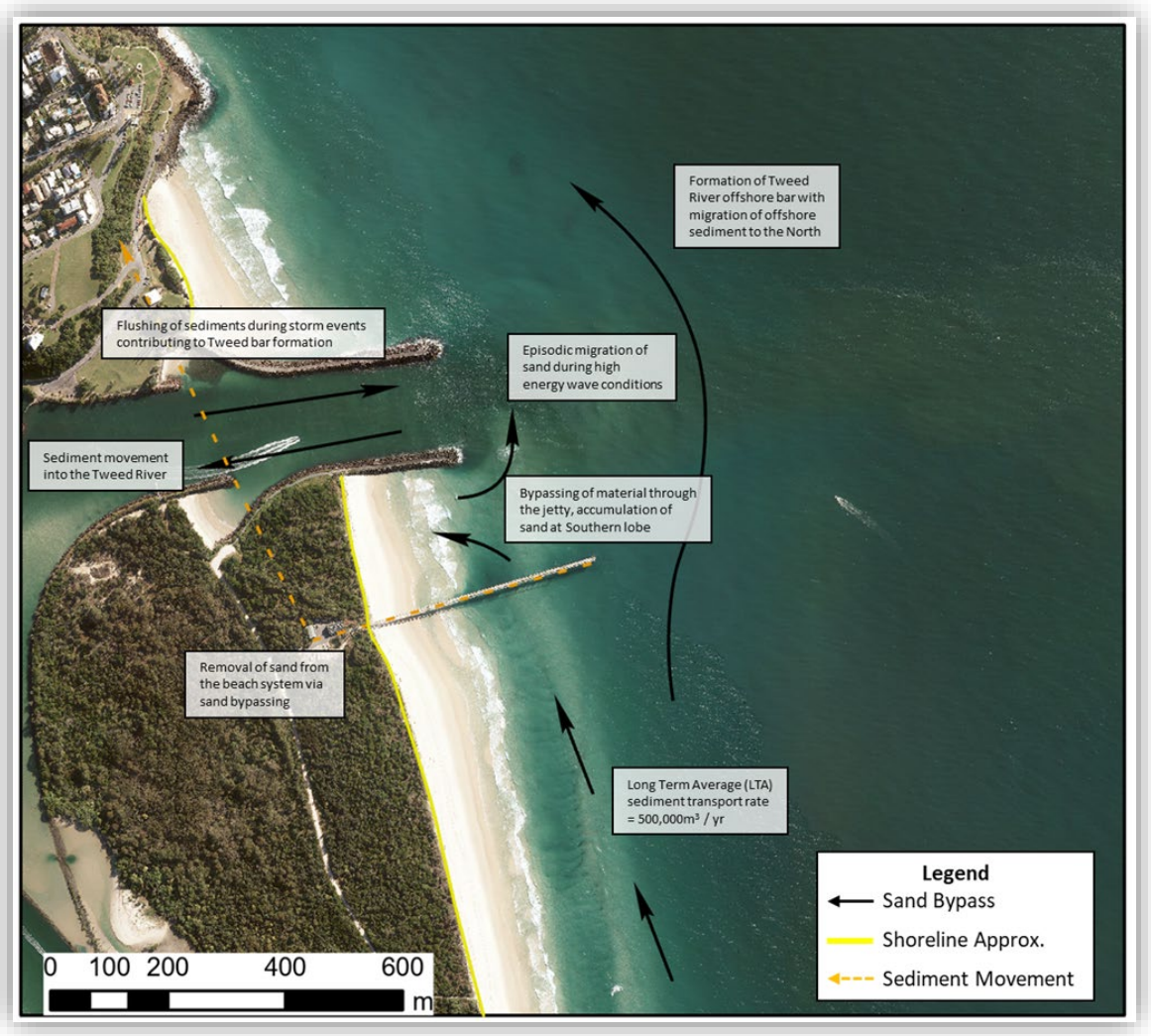


Figure 11 TSB Coastal Processes Illustration

Appendix H

Environmental Incident Reports

Transport for NSW

Environmental Event Report
Form 400 and 624

Remember! **Complete this form for all environmental incidents, non-compliances, report-only events and regulatory action for Transport for NSW (TfNSW) activities. Complete and submit this form in accordance with the TfNSW Environmental Incident Procedure. Be succinct, stick to known facts and do not make assumptions.**

Event details

Project name: Tweed Sand Bypassing - dredgin 2023	*(for use by project if desired)*
Project delivered by: ☐ TfNSW ☑ Contractor (including RMCC)	Event ID #:
Contractor name: McConnell Dowell	Report revision #:
Region: North	CM21 or Equip no.:
Report Type: Environmental Incident	*To determine report type, refer to the definitions in the incident procedure*

Date and Time	Date: 26 May 2023 Time: 1 : 00 am ☑ | pm ☐
Description Provide a factual description of what happened during the event. Include relevant details such as: • expected and/or known impacts • the estimated distance to nearest environmentally sensitive areas, sensitive receivers and waterways (including drainage lines and dry watercourses) • the activity being undertaken when the incident occurred • community complaints or other interactions • approval/licence/permit and the specific condition relating to non-compliance • type of regulatory action received and associated requirements Sketches/diagrams/photos may be referenced and appended to this report.	Our contractor for TSB has engaged a dredging contractor and they have been operating in the Tweed River entrance and offshore of the southern Gold Coast beaches. This morning we were alerted to a hydraulic leak, and the dredging contractor has been coordinating with MSQ on containment offshore of Coolangatta. Details including the latest information about the incident and what contact that has been made with other agencies is in the attached email.
EXACT location of the event (include chainage, landmarks, features, nearest cross street, etc. Maps and plans can be attached to the incident report if appropriate)	Tweed River entrance and offshore Coolangatta (see 24hr vessel tracks in the attached image)
Quantity or volume of material escaped or causing event (provide an estimate if quantity unknown)	50-100 L biodegradable hydraulic fluid
Who identified the event?	☑ Contractor ☐ EPA officer ☐ Council ☐ TfNSW (env. inspection) ☐ EPA complaints line ☐ Community ☐ TfNSW (project team/other) ☐ Other
Was this a pollution incident that caused or threatened material harm to the environment?	☐ Yes ☑ No
Is there an Environment Protection Licence for the project?	☑ Yes ☐ No
▶ If Yes – was the Pollution Incident Response Management Plan implemented?	☑ Yes ☐ No

What immediate actions/control measures were taken to rectify or contain the event?

Detailed in the attached email.
• The vessel sustained some damage to the propulsion hydraulic steering circuit, causing a fluid leak.
• The vessel was moved out of the area anchored in QLD where booms were deployed and the remainder of and the spill was contained.
•The hydraulic system was isolated and the remining fluid was siphoned from the system to avoid any further discharge.

External notification

Were any of the following authorities notified?	Date	Time	Method	Notified by (name and position)
NSW Environment Protection Authority	26 May 2023	:	Email	Stan Viney
NSW Department of Planning, Industry and Environment		:	Email	
NSW Ministry of Health		:	Email	
Fire and Rescue NSW		:	Email	
Heritage NSW		:	Email	
Commonwealth Department of Agriculture, Water and the Environment		:	Email	
NSW Department of Primary Industries (Fisheries)		:	Email	
NSW Rural Fire Service		:	Email	
NSW National Parks and Wildlife Service		:	Email	
SafeWork NSW		:	Email	
Local Government	26 May 2023	:	Telephone	Matt Moore, City of Gold Coast
Other: MSQ, NSW Maritime Pollution		:	Email	

What initial corrective action will be taken to prevent similar events recurring in the near future?

Review of the events leading up to the geabox damage (sea conditions, operational activity) and liaise with the Operations Manager prior to dredging recommencing.

Approvals - please electronically sign this form and send on

Person making report

Name: Matthew Harry

Position: A/Manager Tweed Sand Bypassing

Organisation: TfNSW

Signature: Matthew Harry Digitally signed by Matthew Harry Date: 2023.05.26 15:53:42 +10'00'

Date: 26 May 2023

Forward by Email

TfNSW Safety Environment and Quality Coordinator (TfNSW Regional Maintenance and Delivery only)

Name:

Signature: Date:

Forward by Email

Incident classification to be completed by TfNSW Environment Manager:

Incident Classification: Environment | Reputation and Integrity | Regulations and Compliance

Provide a classification for environmental incidents only. Refer to incident procedure for classification criteria.

Is the incident a 'Significant Incident'? *(C3 - C1 incident or likely to receive penalty notice or prosecution)* ☐ Yes ☐ No

Is an investigation required? ☐ Yes ☐ No

Was the event self-reported by the delivery team? ☐ Yes ☐ No

An event is self-reported if:
- *the project team pro-actively reports the event outside of a TfNSW environmental inspection*
- *the event is identified or occurs for the first time during a TfNSW environmental inspection*

An event is not self-reported if:
- *the project team should have been or were aware of the incident but had not reported it. These incidents may be identified by TfNSW, external regulators, or the community*

Name: Signature:

Comments:

Date:

Forward by Email

Customers of Transport Shared Services are reminded of their responsibility in terms of the compliance and audit requirements for digital signatures. Transport Shared Services does not accept responsibility for this obligation and customers are advised to check the status of digital signatures with their organisation prior to proceeding.

Australian Government
Australian Maritime Safety Authority

INCIDENT ALERT

NOTE: This form must be sent to reports@amsa.gov.au by the Owner, Operator or Master as soon as reasonably practicable* after becoming aware of the incident. Find out more about incident reporting and your reporting obligations at www.amsa.gov.au/general-incident-reporting. For information about how we collect, use and disclose your personal information, please visit the AMSA privacy policy at www.amsa.gov.au/privacy

For pollution, use the POLREP Form.

PART A: VESSEL INFORMATION

Vessel name: Modi R	Flag: Denmark
IMO number (if applicable): 8876091	Unique identifier (if applicable): OWZF 2
Master: Rune Moss	
Operator/Company name: RN Dredging	
Responsible person: Rune Moss	
Contact details: modi@rohde-nielsen.dk	
Domestic commercial vessel (please tick if applicable) Class: ☐ 1 ☐ 2 ☐ 3 ☐ 4 Operational Area: ☐ A ☐ B Ext ☐ B ☐ C ☐ C Rest ☐ D ☐ E	

PART B: INCIDENT DETAILS

Date: 26-05-2023	Time Local: 0035 UTC: 1335
Voyage From: Operating Tweed heads	To: Operating Tweed heads
Location description: Tweed heads dredge area	
Lat: 28 10.15S	Long: 153 33.43

Vessel activity at the time of the incident

- ☐ Underway
- ☐ Berthed
- ☐ Towing
- ☐ Berthing/Unberthing
- ☐ Anchored
- ☐ Fishing/Unloading
- ☐ Loading/Unloading
- ☐ Being towed
- ☑ Other (specify): Dredging

Pilot on board? ☐ Yes ☑ No

Cargo on board? ☐ Yes ☑ No

Cargo type: _____

Occurrence Type (please tick as relevant)

- ☐ Injury
- ☐ Illness
- ☐ Death
- ☐ Medical evacuation
- ☐ Person overboard with lifejacket
- ☐ Person overboard without lifejacket
- ☐ Equipment/machinery failure
- ☐ Contact with something other than a vessel
- ☐ Collision with another vessel
- ☑ Grounding
- ☐ Damage
- ☐ Disabled
- ☐ Foundering/sinking/presumed lost
- ☐ Listing/capsize
- ☐ Flooding
- ☐ Fire/smoke
- ☐ Loss of cargo/dangerous goods
- ☐ Leakage/spillage of dangerous goods
- ☑ MARPOL issues
- ☐ Near miss/ Dangerous occurrence
- ☐ Other (specify below):

_____

PART C: WHAT HAPPENED?

Describe Who, What, When, Where, How the incident occurred. If relevant, a diagram of the incident may be provided in the space below.

0035: while conducting dredging operations in Tweed heads, vessel makes bottom contact due to swell conditions

after contact vessel proceeds out of break to drift to attempt to inspect damage. damage found to vessel STBD shottle

0130: Master and Chief engineer called, consult with super intendant regarding course of action, and decision made to proceed to anchor.

0515: Chief Engineer comes on watch early and identifies oil missing from STBD shottle and later identifies a slick behind the vessel at first light.

NOTE: Only personal information that is required by the form should be provided as part of the reporting process. Additional information, for example, passport details are not required to be provided to AMSA.

*Under *Marine Order 1 (Administration) 2013,* regulated Australian vessels and foreign vessels must submit an incident alert within 4 hours.