

ATTACHMENT NINETEEN

Assessment of Navigational Safety Effects (B. Goodchild)





NAVIGATION SAFETY ASSESSMENT

William Fraser Sand Extraction in Bream Bay

Abstract

McCullum Bros Limited is seeking to extract sand mostly by day from a designated area in Bream Bay using their vessel "William Fraser". This navigation safety assessment has been carried out by the Harbourmaster's Department, Northland Regional Council. The report is solely concerned with the navigational safety impact of the operation. It in no way covers any possible environmental or cultural impacts, nor does it confer any support or otherwise for the operation.

Bruce Goodchild



Contents

Introduction	2
Designated Area.....	2
William Fraser – Sand Extraction Vessel	4
Local Port Service (LPS).....	6
Shipping movements	7
Recreational Vessels	8
Commercial Fishing Vessels	9
Environmental Conditions in Bream Bay	9
Extraction Operations	11
Signals	11
Harbour Safety Meetings.....	12
Harbourmaster Guidelines	12
Conclusion.....	13

Code of Conduct Reference for Application Material

Although this is not a hearing before the Environment Court, I record that I have read and agree to comply with the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023 as relevant to preparation of a report for this Fast-Track application. I confirm that this report is within my area of expertise, except where I state that I rely upon the evidence or reports of other expert witnesses lodged forming part of the project's application material. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed.

Confidentiality statement

This report is the intellectual property and confidential information of McCallum Bros Limited (Disclosing Party) and is provided strictly on a confidential basis to the recipient party. In consideration for the Disclosing Party allowing the recipient party access to this report, the recipient party warrants that it will keep and will ensure that its employees, agents and contractors keep the report confidential and will not disclose any of the contents of the report whatsoever.

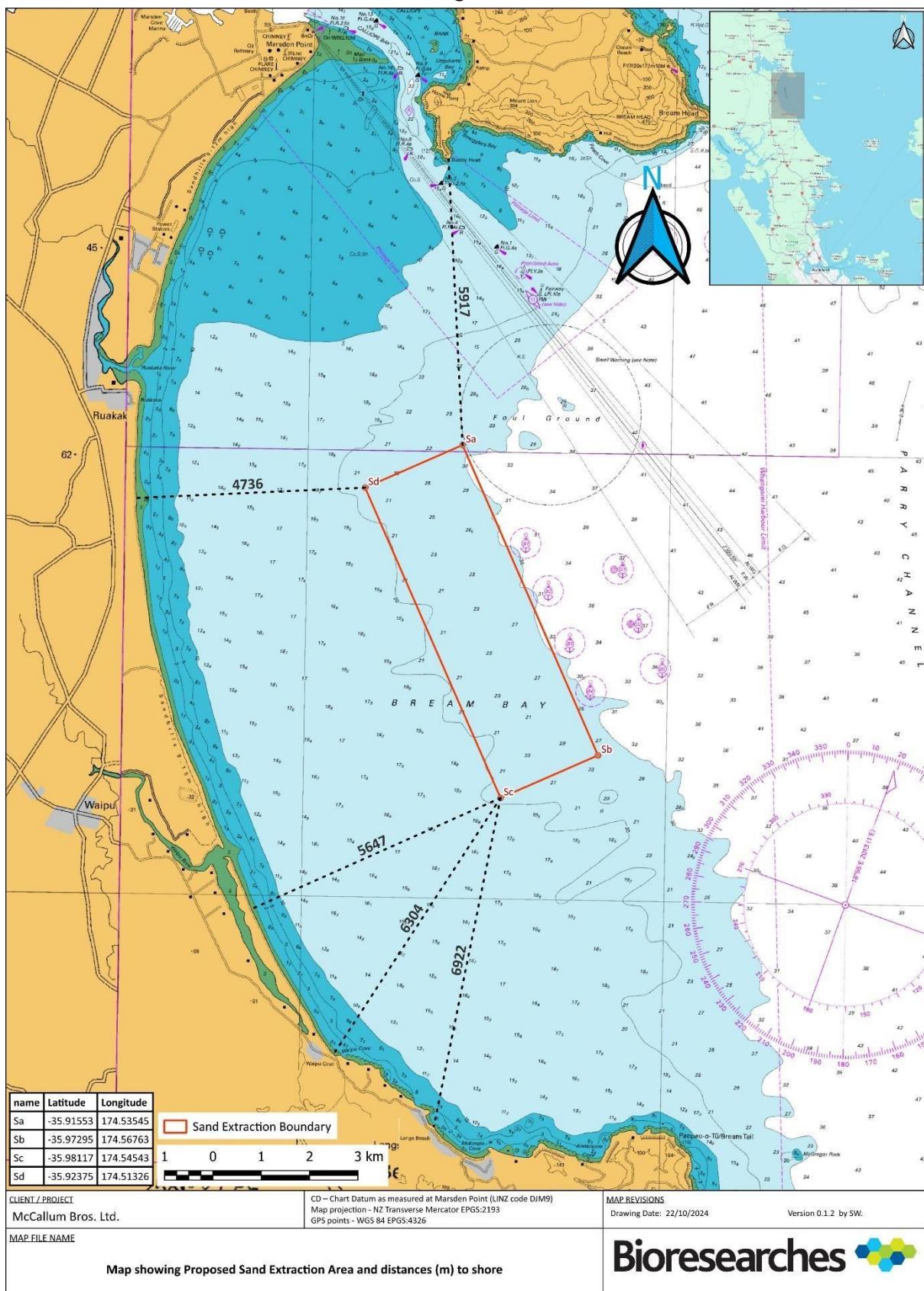
Introduction

McCallum Bros Limited (MBL) is applying for a resource consent to extract sand mostly by day from a designated area in Bream Bay, Northland. This assessment shows that MBL's proposed operation is compliant with maritime safety rules and will not create navigational safety issues to other users of the bay, primarily North Port and Channel Infrastructure, but also the many other users of Bream Bay. This assessment has been carried out by the Harbourmaster's Department of Northland Regional Council (NRC).

Designated Area

The sand extraction application area is located centrally in Bream Bay and is west of the anchorage area. It is southwest of the harbour shipping channel and the rocky reef north of the anchorage area as shown on the map over the page. There are also two ecological control areas. These are locations where ecological and other sampling will be undertaken as part of ongoing monitoring studies related to the operation. Sand extraction will only occur within the red box indicated as the 'Sand Extraction Area'. There is a further control zone located just south of Mangawhai Harbour, I have not considered it for this assessment as it will not impact activities in the Bream Bay area. The operation will be predominantly by day. Daytime extraction hours proposed are 12:00 pm – 6:00 pm (April-September) and 12:00 pm – 8:00 pm (October-March). Extraction is proposed to be limited to no more than 3.5 hours per visit. The extraction area is west of the southern anchorage area, and several kilometres southwest of the Whangārei Harbour channel. Sand extraction will occur in an area between the water depths of 20-30 m. Ship anchorage positions B1, B2, B3 and B4 are within 100 m of the eastern boundary of the sand extraction area. The sand extraction area is largely south east of the coastal township of Ruakākā and Ruakākā Beach and at its closest point to shore is 4.7 km (2.54 nautical miles) distant.

The sand extraction area itself is 15.4 km² (7 km x 2.2 km) divided into sub areas with a designated number and letter. There are 7 columns/sections which are further subdivided into 11 rows/subsections A-K. The area therefore has 77 sub areas. These subsections have been established for monitoring purposes. The *William Fraser* is a trailing suction vessel and will extract a strip in the sand no more than 3.5 hours travelling an average of approximately 13 km. These times and distances are estimates based on averages.



William Fraser – Sand Extraction Vessel



William Fraser

The *William Fraser* is a modern, purpose-built trailing suction barge that is 68 m in length overall. It was built in 2019 and has been extracting sand off the coast of Pākiri Beach since 2019 and has not had any navigational, safety, or environmental issues to date. The ship is well fitted out with a modern bridge and two sets of all relevant instrumentation, which is fit for purpose including:

- Furuno Electronic Chart System. • Furuno ARPA Radar; and • GPS/ AIS.



© Samsung Dual Camera
© Shot with my Galaxy A03

Bridge Layout - *William Fraser*

She was inspected by the Deputy Harbourmaster on the 8th of October 2024, and he interviewed the new Master Tai Fredricsen who has a pilotage exemption for Whangārei Harbour.

The bridge offers good visibility for the Master and lookout. She is always staffed with two personnel on the bridge during sand extraction operations.

She is fitted with a series of six moon pools to reduce extraction sediment plumes. Her extraction “drag head” is located on the starboard side of the vessel. She is twin screw with a bow thruster and therefore very manoeuvrable.

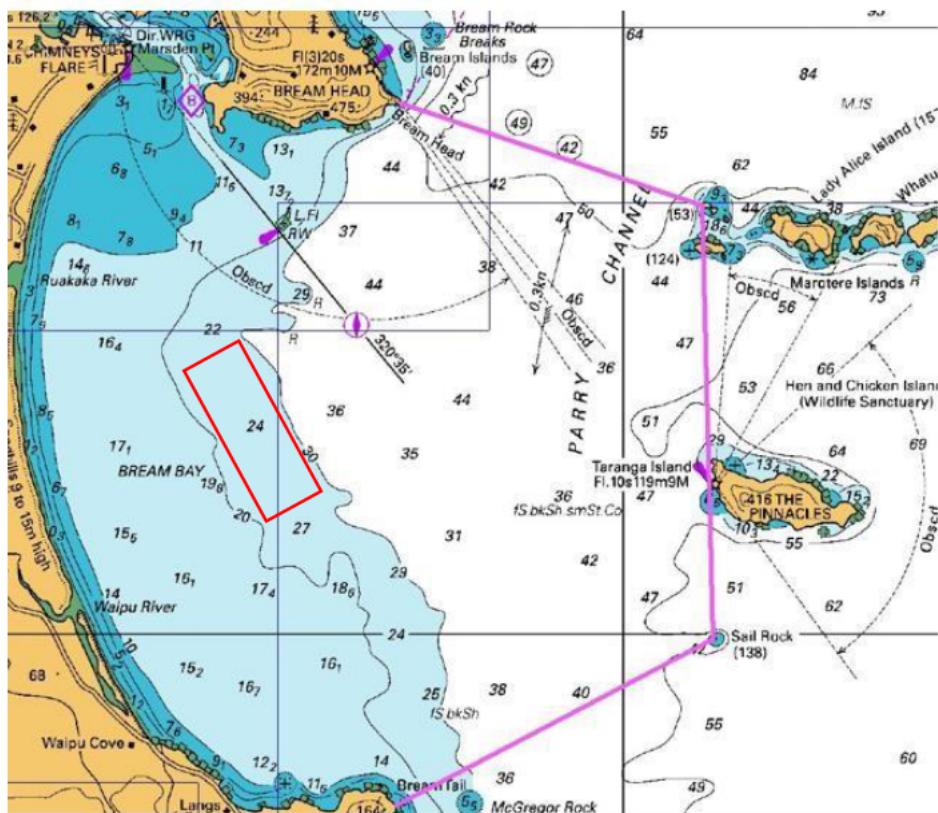


William Fraser Propulsion

Local Port Service (LPS)

The sand extraction area lies within the Local Port Service Area of Whangārei Harbour Radio. Northport Limited provides a harbour monitoring system, which uses both radar coverage and AIS transponder transmissions to monitor vessels and craft transiting the commercial channels of Whangārei Harbour and its approaches.

The system operates to Vessel Traffic Services (VTS) principles, harbour watch/radio personnel are trained with most International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) standard modules as required for a Port Information Service, recognising that Northport Limited delivers a Local Port Service only.



Local Port Service Area Bream Bay (magenta boundary) showing approximate location sand extraction area

Under the Northport Safety Management System Northport LPS will:

- Provide and promulgate Whangārei Harbour Radio as a Local Port Service which operates to a Traffic Information Standard for Harbour Operations.
- Ensure all staff are trained to a LPS Service standard, by training to a subset of the IALA V103-1 VTS standard.
- Provide and maintain equipment & software to meet the IALA Information Service Standard for LPS delivery.
- Provide refresher training and testing for all staff providing LPS delivery to ensure a professional standard is being delivered.
- Retain historic re-playable records of vessel transits and VHF for up to 60 days. These will be provided to any bona-fide incident investigator.

- Immediately inform all users of temporary reductions in service.
- Maintain detailed and accurate shipping records.
- Monitor and record all Pilot Exempt Certificate holder transits and report these to the Harbourmaster.
- Use the LPS replay capability to review movements and assess compliance with best practice, by pilotage, and towage.
- Review the LPS system and staff delivery annually.

Shipping movements

The *William Fraser* will be operating in the LPS area and will have the benefit of surveillance from the Northport LPS. The Bream Bay area is used for commercial shipping movements into and out of Whangārei Harbour and there are designated anchorage positions in the bay. Ships using the anchorage positions are typically log ships, tankers and container ships up to 300 m in length overall. Ships contact the LPS via VHF and are provided a designated anchorage position. They are also advised of any commercial traffic movements which may affect them. The movement of large ships is in the majority to the east of the sand extraction area. Movement of ships is monitored by the LPS, Marine Traffic (internet service) and by Transit Analyst software operated by North Tugz Limited. Prediction of shipping movements is available for all inbound and outbound ships via the shipping page on the Northport website and is kept up to date by the LPS via Whangārei Harbour Radio.

All Harbour Vessels

All Shipping Movements	Channel Infrastructure Page	Northport	Upper Harbour	Cruise Ships	Printer Friendly Version
Departed Vessels					

In Port

Ship Name	ETA	Pilot on Board	ETD	Berth	Agent	Stevedores	Cargo	Last port	Next Port
Falkanger	14/10/2024 - 16:00	14/10/2024 - 16:00	17/10/2024 - 14:00	Jetty 1	ISS - McKay	CIL	Refined Products (Discharge)	Korea	Sea
Lignum Mesh	15/10/2024 - 20:00	15/10/2024 - 20:00	17/10/2024 - 20:00	MP 2	Nautilus/OVEL	Qube	Logs (Load)	Napier	Sea
Hunari	16/10/2024 - 02:00	16/10/2024 - 08:00	19/10/2024 - 02:00	MP 1	LMS	Qube	Coal (Discharge)	Gladstone	Napier
Aotearoa Chief	16/10/2024 - 16:00		18/10/2024 - 09:00	Portland	GBC	GBC	Cement (Load)	Tauranga	Auckland
Magnolia Express	16/10/2024 - 19:00	16/10/2024 - 19:00	18/10/2024 - 23:00	Jetty 2	Quadrant	CIL	Refined Products (Discharge)	Sea	Sea

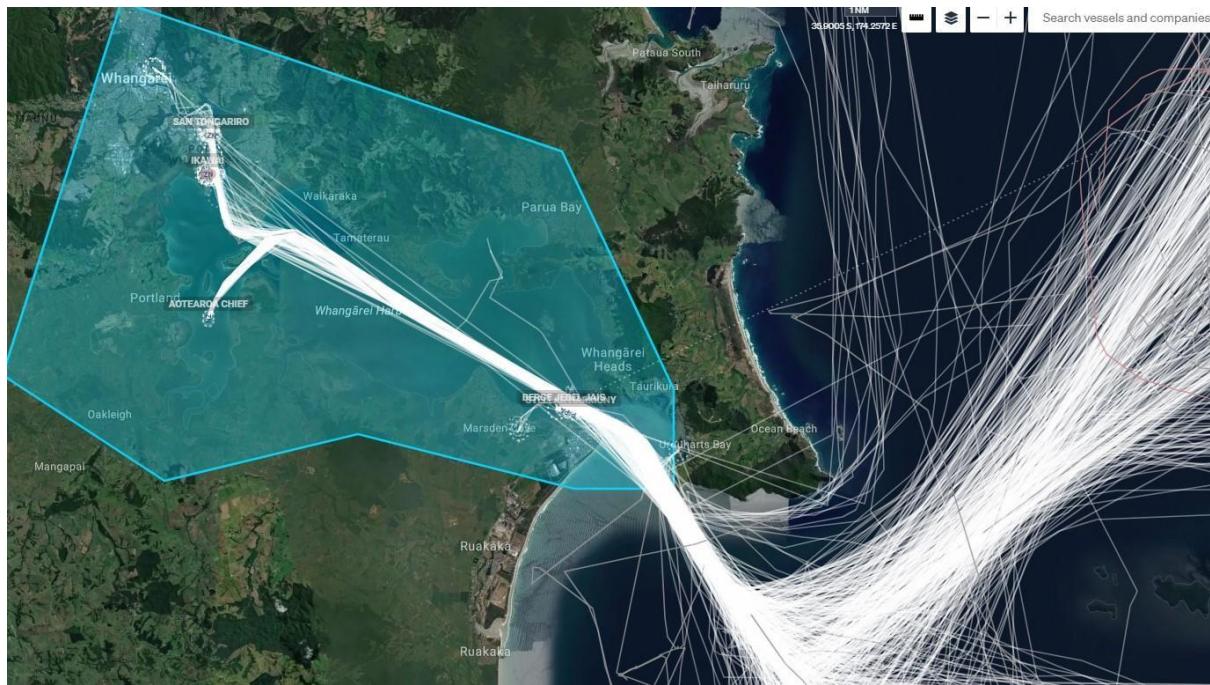
Expected Shipping

Ship Name	ETA	Pilot on Board	ETD	Berth	Agent	Stevedores	Cargo	Last port	Next Port
CSC Auspicious	18/10/2024 - 07:00	18/10/2024 - 07:45	20/10/2024 - 06:00	Jetty 1	ISS - McKay	CIL	Refined Products (Discharge)	Sea	Sea

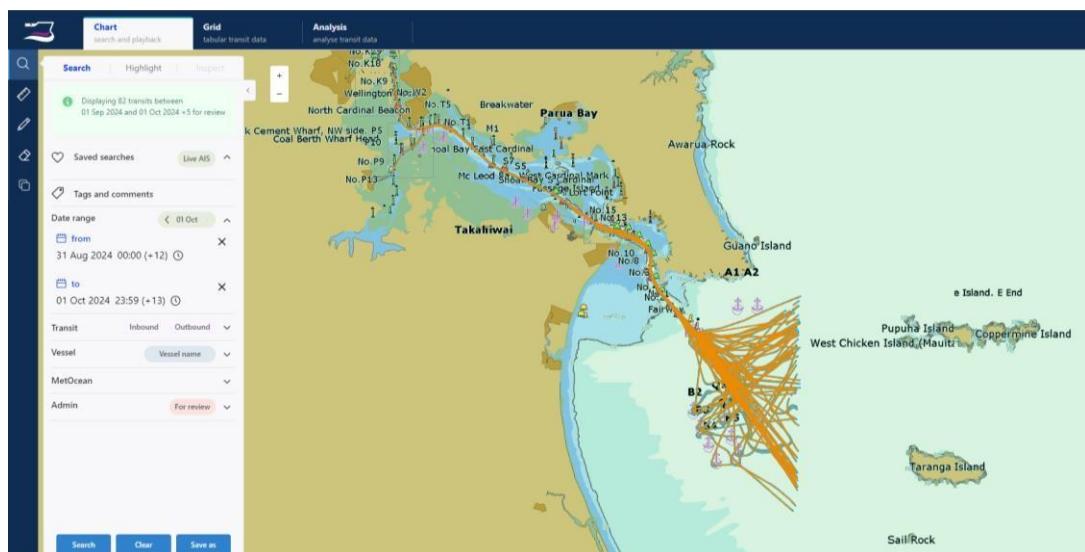
Northport Website Shipping Page All Harbour Vessels There is comprehensive historical data on the movement of commercial vessels through the Bream Bay area. Table below shows ship numbers.

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Northport	265	271	257	303	283	309	298	262	237	211
CI/RNZ	223	221	192	202	198	220	159	146	122	123
Portland	189	185	134	62	94	60	116	114	125	109
Upper Harbour	27	23	56	19	12	12	23	12	Inc in Portland above	Inc in Portland above
Total Ships	704	700	639	586	587	601	596	534	484	443

Movements = ship numbers x 2



All Commercial Shipping May 2023-May 2024 Includes fishing boats AIS equipped. Marine Traffic.Com



Commercial shipping 31st Aug 1st Oct 2024 Transit Analyst

The *William Fraser* will be entering and leaving the sand extraction area from the south in most cases and will generally be clear of commercial shipping movement.

Recreational Vessels

Recreational vessels can be present in the sand extraction area especially by day, normally drift fishing. Most of these vessels are less than 10 metres in length. Kayakers are sometimes seen off Ruakākā Beach but are limited to calm and light offshore winds. Kayakers tend to remain within 2 nautical miles of the shore. Kayakers are predominately fishing. Recreational vessels will unlikely show on radar unless very close, so a good lookout is necessary.

Historical data is very limited for small recreational fishermen, but it is not unknown for up to 50 vessels to be present in summer daylight conditions off Ruakākā Beach. The *William Fraser* will be navigating at slow speed 2 knots during extraction and will be easily visible and audible to small craft. Under Part 22 Maritime Rules, (Collision Prevention) from Maritime New Zealand, small craft must keep clear of vessels restricted in their ability to manoeuvre when carrying out underwater operations (sand extraction). Unfortunately, many recreational fishermen within Whangārei Harbour are unaware of the collision prevention rules and do not know their responsibilities. This is evidenced by the number of small craft incidents with large commercial vessels within Whangārei Harbour. There is a risk that recreational craft will impede the passage of the *William Fraser* however the extraction area is open which allows plenty of manoeuvring space. *William Fraser* is equipped with a whistle to attract the attention of the small craft and is also travelling at a very slow speed. It is considered a manageable risk for the *William Fraser*.

Commercial Fishing Vessels

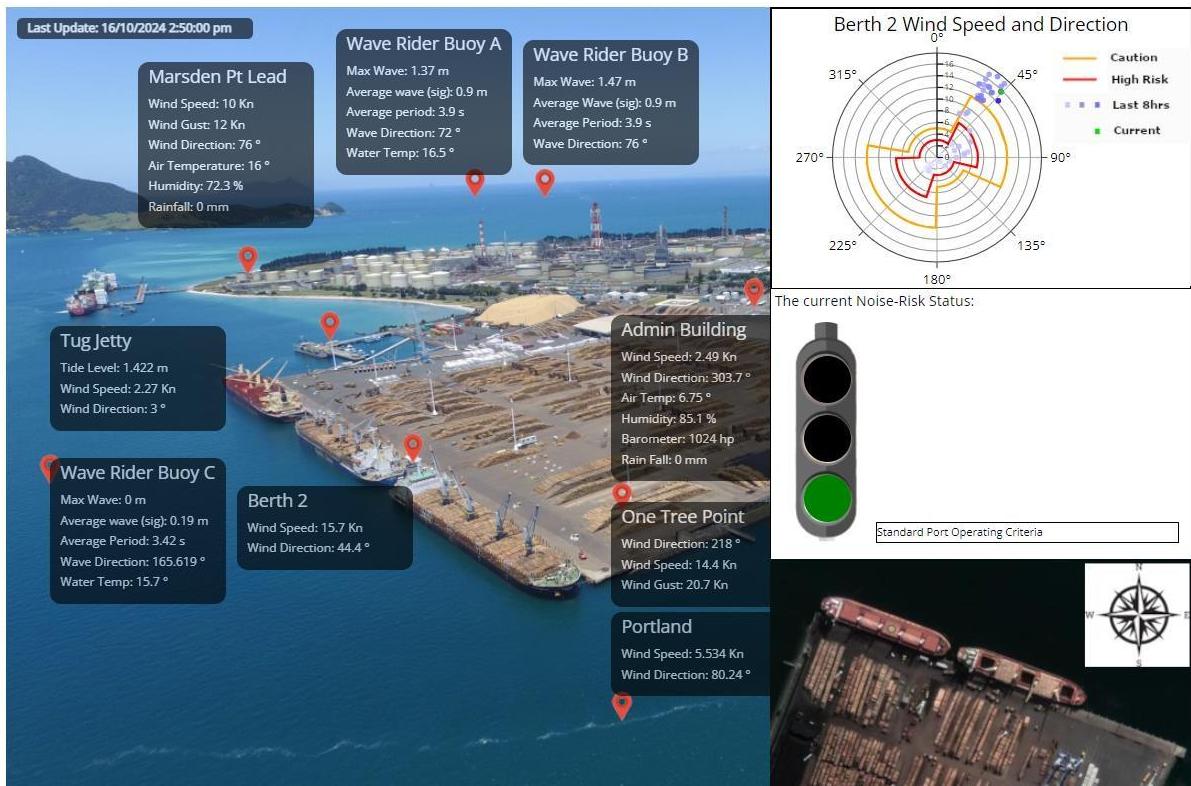
Commercial fishing vessels operate in Bream Bay. These include scallop fisherman, long liners and pilchard fisherman amongst others. In general the sand extraction area is clear of where most commercial fishermen will operate however some fisherman will be affected by the sand extraction. Under Part 22 Maritime Rules, (Collision Prevention) from Maritime New Zealand, vessels engaged in fishing underway must keep clear of vessels restricted in their ability to manoeuvre when carrying out underwater operations (sand extraction). Commercial fishing representatives will be informed of the extraction operations through Whangārei Harbour Radio. Early communication of the proposed extraction area will assist fishermen in planning their activities to remain clear of extraction activities.

Environmental Conditions in Bream Bay

Bream Bay through the LPS is provided with good wave and wind measurements. Two waverider buoys are located off Bream Head and there is an anemometer set up on the Marsden Point Lead into Whangārei Harbour. Tide gauges are established at Northport. Readouts are available on the Northport website for actual and forecast conditions. Forecast conditions are also provided by MetService.

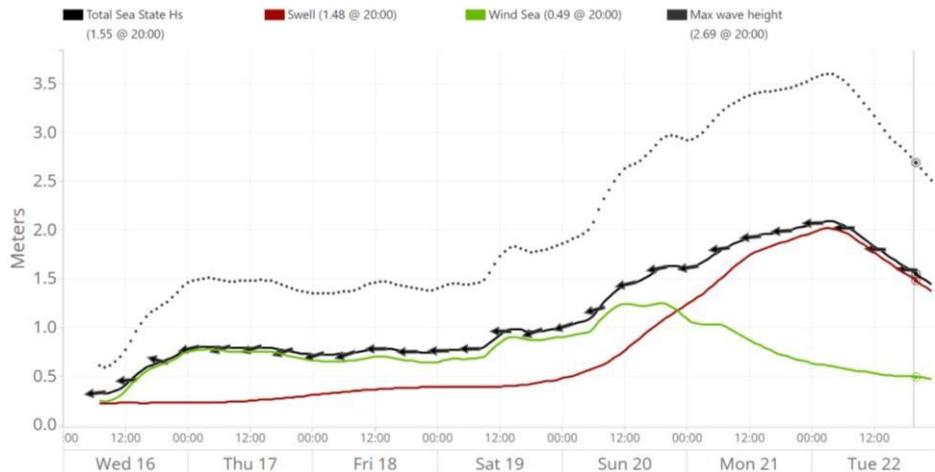
Northport Weather

Forecast



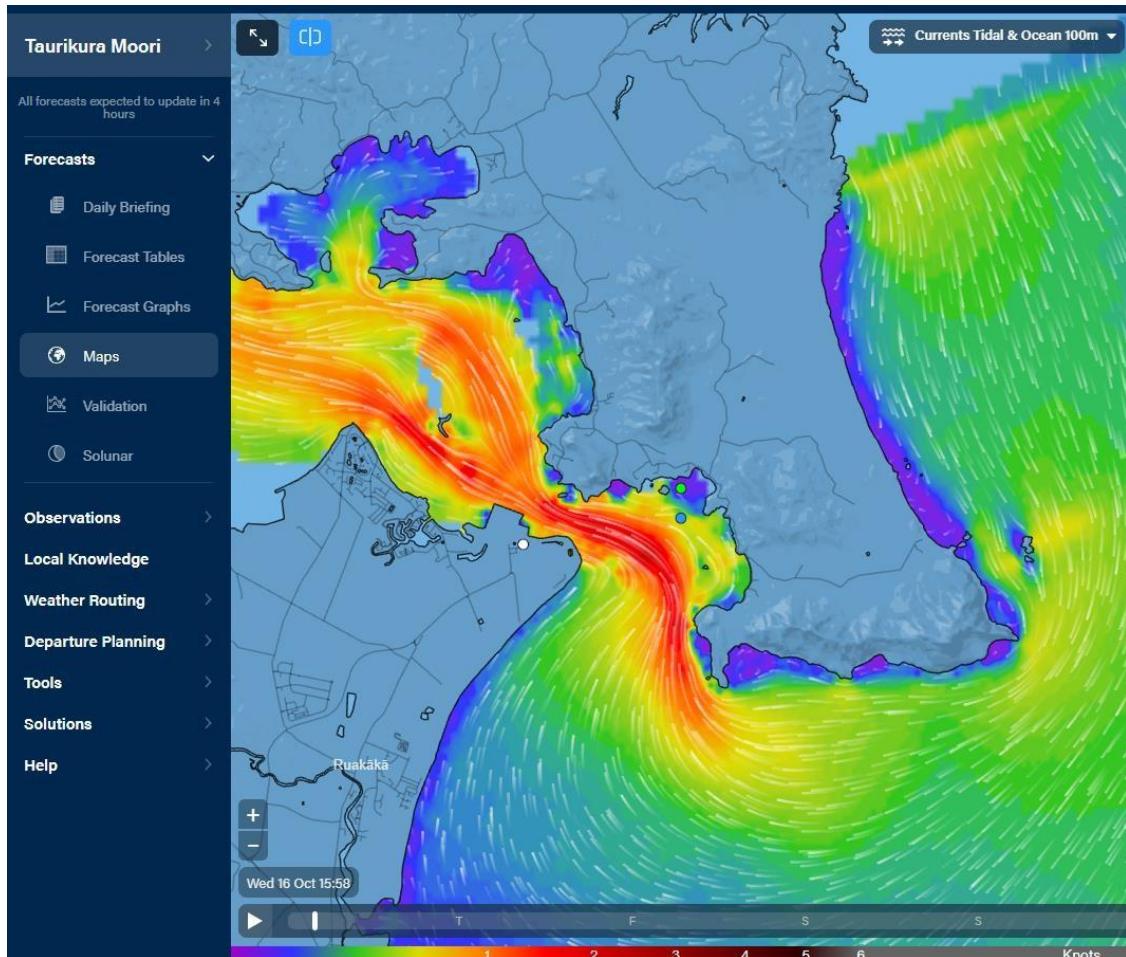
Northport Weather Livefeed

WAVE FORECAST WAVE RIDER BUOY B



Northport Weather Forecast (via Meteorological Service of New Zealand Limited)

Tidal stream analysis is also available through the Predict wind service and offers a six hourly graphical prediction services. This is commercially available for a subscriber.



Predict wind tidal stream prediction service

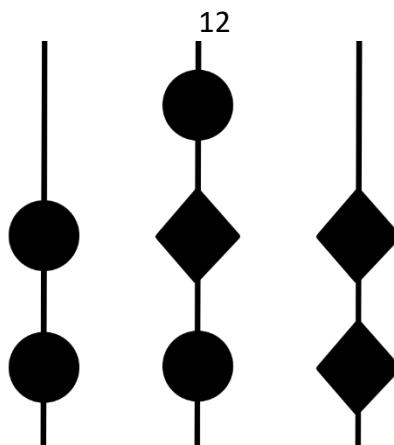
Extraction Operations

The sand extraction operation summary is as provided below:

- Extraction speed: between 1.5 and 2.5 knots.
- Extraction time: a maximum of 3.5 hours
- Daytime extraction hours 12:00 pm – 6:00 pm (April-September) and 12:00 pm – 8:00 pm (October-March).
- Frequency: for the first 3 years there would be approximately 3-4 trips per week, with a maximum of 162 trips per year. For the following 32 years, there would be approximately 5-6 trips per week, with a maximum of 270 trips per year.

Signals

Day shapes on the *William Fraser* are compliant with the requirements of maritime rules (Restricted in Ability to Manoeuvre shapes). Ball Diamond Ball vertically disposed shapes with additional Diamond to Diamond vertically disposed shapes to indicate the safe side to pass.



Harbour Safety Meetings

MBL is a harbour stakeholder and attends six weekly Harbour Safety Meetings (HSM) to discuss navigation safety issues. MBL attended the HSM 8th October 2024 and provided a briefing on the proposed sand dredge operation in Bream Bay. There was no issue from the other stakeholders raised at the meeting. This was further discussed on 4th February 2025.

Harbourmaster Guidelines

The following guidelines should be followed to ensure navigational safety with the sand extraction operation:

- Prior to the formal commencement of sand extraction operations there must be a safety meeting between NRC, commercial fishing representatives, Northport LPS and MBL to go over procedures and protocols to be followed.
- 12 hrs prior to an operation MBL must contact Whangārei Harbour Radio to confirm shipping and provide the sub area for the extraction operation. Contact is by email and phone.
- The *William Fraser* proposed operating location can be placed on the Northport shipping page by LPS. This will facilitate commercial fisherman in planning their activities clear of the sand extraction.
- The *William Fraser* must contact LPS (Whangārei Harbour Radio) via VHF radio upon entry to the LPS service area. The *William Fraser* must contact Whangārei Harbour Radio via VHF when a sand extraction operation is completed for the day. Entry and exit of the area must be via the southern approach unless otherwise agreed.
- The *William Fraser* should maintain a safe passing distance from all anchored vessels (0.25 nautical miles).
- LPS must inform all shipping including commercial fishing vessels in Bream Bay of the presence of the *William Fraser* and the approximate area she is working.
- Ships coming to anchor will be given an anchorage number well clear of the sand extraction operating location.
- The *William Fraser* is to maintain two persons on the bridge during sand extraction operations.

- The *William Fraser* is to ensure all bridge equipment is fully operational when carrying out extraction operations and the correct day signals to be displayed. At night they will show the correct night signals.
- If shipping movements change during extraction operations, Whangārei Harbour Radio will inform the *William Fraser* by VHF of the impending change.

Conclusion

It is considered that the proposed sand extraction operation in Bream Bay can be competently managed with respect to navigational safety and does not impose an unacceptable risk for the NRC and other stakeholders (Northport/ CI, Golden Bay or commercial or recreational users) using the Bay. Harbourmaster guidelines and Navigation Safety Bylaws must be followed.