

Port Taranaki Ltd  
Maintenance Dredging  
Monitoring Programme  
Biennial Report  
2018-2020

Technical Report 2020-31

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## Executive summary

Port Taranaki Ltd (the Company) is the commercial operator of the port located on Breakwater Road, New Plymouth. Port Taranaki is an artificially created harbour which is contained by two breakwaters enclosing 94 hectares of sheltered water. The Company undertakes regular dredging to maintain navigable channels within the port. Sand accumulates in large quantities around the tip of the main breakwater and this has to be removed on a regular basis in order to maintain the required depth in the entrance channel. Due to this accumulation of sand around the breakwater, the city beaches to the north east of the port have previously been starved of sand.

This report for the period July 2018 to June 2020 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company's environmental and consent compliance performance relating to the dredge campaign during the period under review and the results and environmental effects of the campaign.

The Company holds three resource consents related to this report, which include a total of 28 conditions setting out the requirements that the Company must satisfy. The Company holds one consent to dredge accumulated sediments within Port Taranaki and two consents that allow them to discharge sediment into the inshore and offshore spoil disposal areas in the Tasman Sea.

**During the monitoring period, the Company demonstrated an overall high level of environmental performance.**

The Council's monitoring programme for the 2018-2020 period included reviewing the dredge campaign information, four intertidal sand inspections along the New Plymouth foreshore, one intertidal survey at four sites and one kaimoana survey at five sites.

The monitoring showed no adverse effects in the coastal environment attributable to the 2019 maintenance dredging campaign. For the first time since 2004, the Company did not exercise their resource consent to deposit dredge material at the inshore disposal ground, due to there being insufficient remaining capacity at the time. There is growing evidence that the rate of natural sediment transport into the harbour has increased in recent years, resulting in the Company having to remove greater volumes when dredging. There were no unauthorised incidents recording non-compliance in respect of this Company's maintenance dredging campaign during the period under review.

During the year, the Company demonstrated a high level of environmental and administrative performance with the resource consents covering their maintenance dredging activities.

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.

For reference, in the 2019-2020 year, consent holders were found to achieve a high level of environmental performance and compliance for 81% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 17% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance over the last several years, this report shows that the Company's performance has improved in the year under review.

This report includes recommendations for the 2020-2022 monitoring period.



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# 1 Introduction

## 1.1 Compliance monitoring programme reports and the Resource Management Act 1991

### 1.1.1 Introduction

This report is for the period July 2018 to June 2020 by the Council describing the monitoring programme associated with resource consents held by Port Taranaki Ltd (the Company).

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by the Company that relate to the dredging of sediments within Port Taranaki and the discharge of these sediments to the Tasman Sea.

This is the fifth combined report by the Council for the Company.

### 1.1.2 Structure of this report

**Section 1** of this report is a background section. It sets out general information about:

- consent compliance monitoring under the *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held by the Company;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted by the Company.

**Section 2** presents the results of monitoring during the period under review, including scientific and technical data.

**Section 3** discusses the results, their interpretations, and their significance for the environment.

**Section 4** presents recommendations to be implemented in the 2020-2022 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

### 1.1.3 The Resource Management Act 1991 and monitoring

The RMA primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

- a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
- b. physical effects on the locality, including landscape, amenity and visual effects;
- c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
- d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
- e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' inasmuch as is appropriate for each activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of

the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

#### 1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the Company, this report also assigns them a rating for their environmental and administrative performance during the period under review.

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

##### Environmental Performance

**High:** No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

**Good:** Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

**Improvement required:** Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

**Poor:** Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent moderate non-compliant

activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

### Administrative performance

**High:** The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

**Good:** Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

**Improvement required:** Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

**Poor:** Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

For reference, in the 2018-2019 year, consent holders were found to achieve a high level of environmental performance and compliance for 83% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 13% of the consents, a good level of environmental performance and compliance was achieved.

For reference, in the 2019-2020 year, consent holders were found to achieve a high level of environmental performance and compliance for 81% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 17% of the consents, a good level of environmental performance and compliance was achieved.<sup>1</sup>

## 1.2 Process description

### 1.2.1 General

Port Taranaki is an artificially created harbour which lies between a group of offshore islands to the west and Kawaroa Reef, which is a large volcanic breccia reef that extends out to the 20 m contour line sub-tidally, to the east.

The port is enclosed by two breakwaters, the Main breakwater and the Lee breakwater, which were created to provide additional shelter to the port and the ships that visit. These breakwaters enclose 94 ha of sheltered water (Figure 1). Since the main breakwater at Port Taranaki was constructed, noticeable effects along the shoreline of New Plymouth have been observed.

A strong net littoral drift of sand occurs in a north-easterly direction along this area of coast. This drift is driven by the high-energy wave climate, which is dominated from the west north-west quarter, and causes sand to accumulate in large quantities around the tip of the main breakwater. Two problems occur as a result of the accumulated sand around the breakwater; firstly there are issues in maintaining the required depth in the shipping channel, secondly erosion of the city beaches to the east of the port has been largely attributed to the port breakwaters interrupting the natural sand transport along the coast.

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<sup>1</sup> The Council has used these compliance grading criteria for almost two decades. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

The accumulated sand needs to be removed on a regular basis. Dredging takes place approximately every two years at Port Taranaki to ensure that ships with a large draft can enter the port safely. Historically the disposal of the dredge spoil has occurred 1,000 m due north of the tip of the main breakwater in water depths of 15 to 20 m. However, once the spoil has been deposited at these depths it is no longer available to contribute to the littoral drift east of the port.

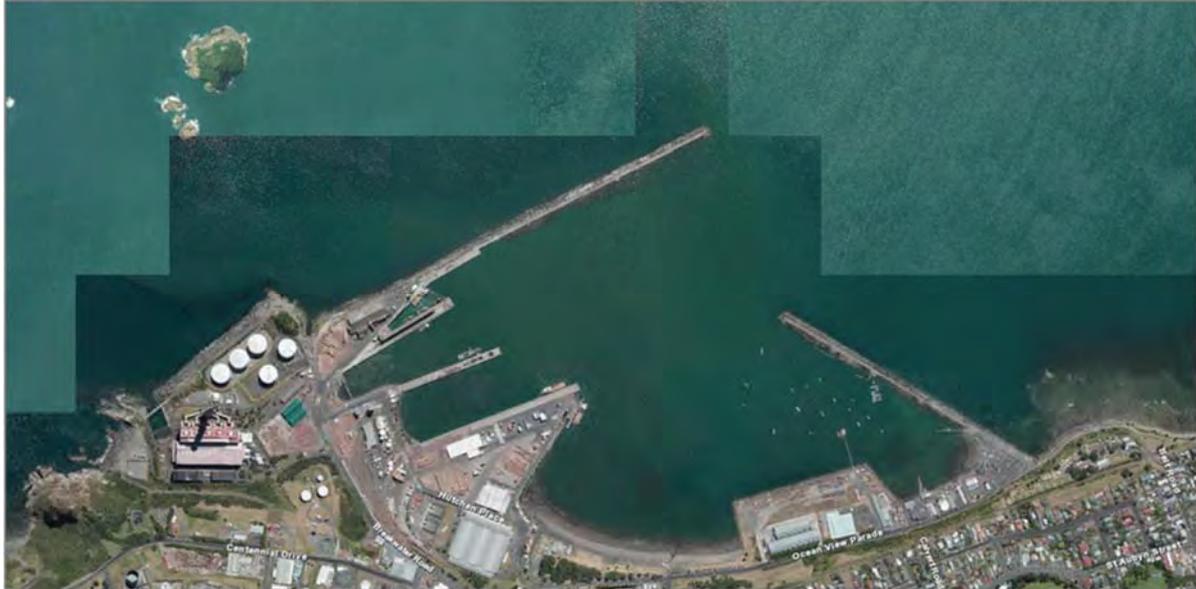


Figure 1 Port Taranaki showing the Main Breakwater on the left and the Lee Breakwater on the right

### 1.2.2 Port Taranaki dredging history

Port Taranaki requires regular dredging. It has been shown that accretion occurs along a bank on the inside of the breakwater. This creates the breakwater bank and it is this feature that gives rise to the majority of the dredging volume.

Since the harbour was first constructed there has been an increase in the coastal erosion north-east of the port and along the city's foreshore and beaches. As a result of this, the Company applied for consent 5886 to introduce this sand back into the natural littoral drift of sand north east of the port.

Previously, the sediments were deposited offshore approximately 1,000 m due north of the port. In 1998 a trial inshore site was used following research by the University of Waikato (Black & McComb, 2000), where 47,000 m<sup>3</sup> of sediment was placed and monitored to investigate the dispersion patterns of sediment within this inshore site. The trial found that placed sediments dispersed in suspension rather than in bedload and that 12 months after the trial 40% of the deposited sand had moved from the deposition area, with some sand moving back towards the port entrance.

The results from this trial led to the positioning of the new inshore dispersal site that is exercised under consent 5886 (Figure 2). This new site is located in front of the city's foreshore, ranging in depth from 6-15 m. The area is 1,290 m long and 580 m wide, which equates to an area of approximately 70 ha. Initially the site was rectangular in shape, but following further investigation it was adjusted due to the location of a kelp forest bordering on the boundary of the site. Restrictions associated with the dredging vessel's draft and sediment movement were taken into account when choosing this site, to ensure that the sediments do not move offshore, as that would defeat the purpose of the consent.

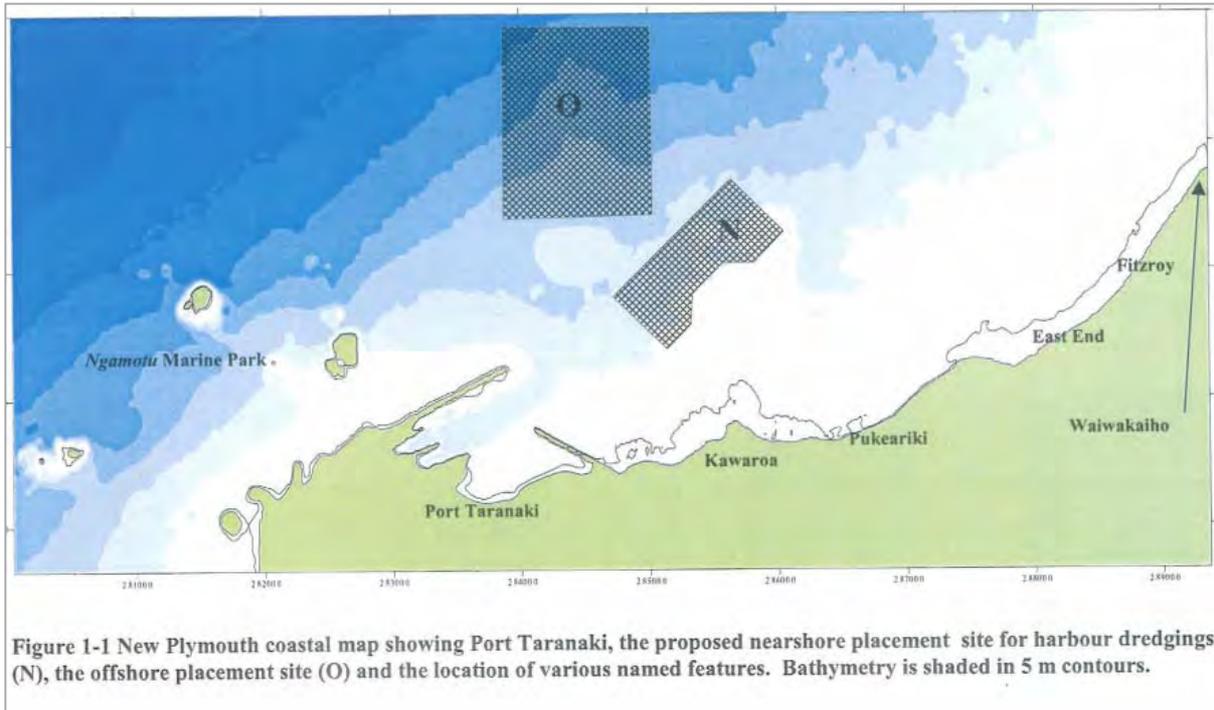


Figure 2 Offshore and inshore disposal grounds for Port Taranaki maintenance dredging (from Atkinson et al. 2001)

Maintenance dredging was carried out by a trailer suction dredge, the *Pelican*, for over 30 years. This was a split hopper dredge with a hopper capacity of 965 m<sup>3</sup>. Once the vessel is full and on site ready to dispose the spoil, the entire hull would open in half and pivot about its longitudinal centreline on hinges just above deck level (Atkinson *et al.*, 2001). The *Pelican* would operate 24 hours a day for 6.5 days per week, with the remaining half day used for maintenance purposes. The 2017 maintenance dredging at Port Taranaki was the *Pelican's* last in the region, before being decommissioned.



Photo 1 The *Pelican* during a dredging campaign at Port Taranaki

In 2019, another trailing suction dredge took over the maintenance dredging for Port Taranaki, the *Albatros*, owned and operated by Dutch Dredging (Photo 2). Compared with the *Pelican*, the *Albatros* has improved

control and accuracy, a greater rate of uptake and discharge of sediment, and greater storage capacity (1,860 m<sup>3</sup>). The overall superior efficiency means that the campaign can run over a shorter period (approximately eight weeks), whilst only operating during daylight hours (06:00 to 18:00).



Photo 2 The *Albatros* trailing suction dredge (photo: <https://www.dutchdredging.nl/>)

### 1.3 Resource consents

The Company holds three resource consents the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as are copies of all permits held by the Company during the period under review.

Table 1 Summary of Port Taranaki's resource consents in relation to maintenance dredging

Consent number	Purpose	Granted	Review	Expires
3982-2.1	To remove up to 570,000 m <sup>3</sup> in any one dredging campaign, and up to 1,045,000 m <sup>3</sup> in any three successive dredging campaigns (or any seven-year period, whatever comes first), of accumulated sediments from the bed of the coastal marine area of the area commonly known as Port Taranaki	18 Mar 2015	Jun 2021	1 Jun 2029
3374-2	To deposit up to 570,000 m <sup>3</sup> in any one dredging campaign, and up to 1,045,000 m <sup>3</sup> in any three successive dredging campaigns (or any seven-year period, whatever comes first) of accumulated sediments removed from the bed of the coastal marine area of the area commonly known as Port Taranaki within an offshore Spoil Disposal Area	28 Jan 2002	Jun 2021	1 Jun 2029

Consent number	Purpose	Granted	Review	Expires
5886-1	To deposit up to 400,000 m <sup>3</sup> in any one dredging campaign, and up to 730,000 m <sup>3</sup> in any three successive dredging campaigns (or any seven-year period whichever comes first), of accumulated sands removed from the bed of the coastal marine area from the area commonly known as Port Taranaki, within an inshore disposal area on the western flank of Kawaroa Reef	9 Apr 2002	Jun 2021	1 Jun 2029

## 1.4 Monitoring programme

### 1.4.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations and seek information from consent holders.

The monitoring programme for the Company's 2019 maintenance dredging campaign consisted of five primary components.

### 1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

### 1.4.3 Review of dredge data

As required by all three consents, following the dredging campaign, the consent holder forwarded the records relating to the inshore disposal area.

### 1.4.4 Intertidal sand inspections

Inspections were carried out before (17 January 2019) and during the dredging campaign (20 March 2019) and twice the following year when no dredging had occurred (13 February 2020, 27 April 2020) in order to assess intertidal sand accretion on Kawaroa and Arakaitai Reefs.

### 1.4.5 Intertidal ecological surveys

Intertidal surveys were conducted at two sites on Kawaroa Reef, one site on Arakaitai Reef and a control site at Greenwood Road between 25 November 2019 and 16 December 2019 in order to assess any changes in intertidal ecological communities that may have resulted from dredging activities.

#### 1.4.6 Kaimoana surveys

Surveys were undertaken at three sites on Kawaroa Reef, one site on Arakaitai Reef and one site off the Lee Breakwater between 10 and 12 February 2020 in order to assess any changes in kaimoana populations that may have resulted from dredging activities.

## 2 Results

### 2.1 Dredging campaign

Dredging was undertaken on one occasion during the period July 2018 to June 2020. The dredging and disposal operation commenced on 5 February 2019 and finished on 25 March 2019 (approximately seven weeks in total). The dredging campaign volume data is summarised in Table 2, along with data from previous campaigns.

Prior to commencement of the dredging campaign, bathymetric surveying of the residual sand volume within the inshore disposal ground found a volume of 376,765 m<sup>3</sup>; just 23,235 m<sup>3</sup> less than the total allowable volume authorised by resource consent 5886-1 (400,000 m<sup>3</sup>). Due to limited capacity within the inshore disposal ground, the Company could not ensure compliance with resource consent requirements, therefore, it was decided not to exercise this consent. Instead, all dredging sediments were disposed at the offshore ground, authorised by resource consent 3374-2.

A total hopper volume of 466,461 m<sup>3</sup> was disposed of at the offshore ground. This equated to an *in-situ* volume of 432,200 m<sup>3</sup> removed from the main breakwater sandbank, berths and the channel (with site specific bulking factors ranging from 1.116 to 1.08). The majority of the removal volume was from the main breakwater sandbank (308,114 m<sup>3</sup> *in-situ* volume, or 71%).

The removal volume for the 2019 campaign was less than the allowable limit for a single campaign, 570,000 m<sup>3</sup>, authorised by resource consent 3982-2.1 However, the cumulative volume removed during the last three dredging campaigns is now 1,051,579 m<sup>3</sup>; exceeding the allowable cumulative limit of 1,045,000 m<sup>3</sup> by approximately 0.6%. Removal volumes were calculated based on hopper volumes corrected to *in-situ* volumes (as per the disposal volumes).

Following completion of the dredging campaign, the inshore disposal ground was re-surveyed (Figure 3, Table 2). The volume had increased by 12,736 m<sup>3</sup> over the seven week duration of the dredging campaign, to a final volume of 389,501 m<sup>3</sup>; demonstrating the influence of natural processes on near shore sand movement. These results are discussed further in section 3.1.

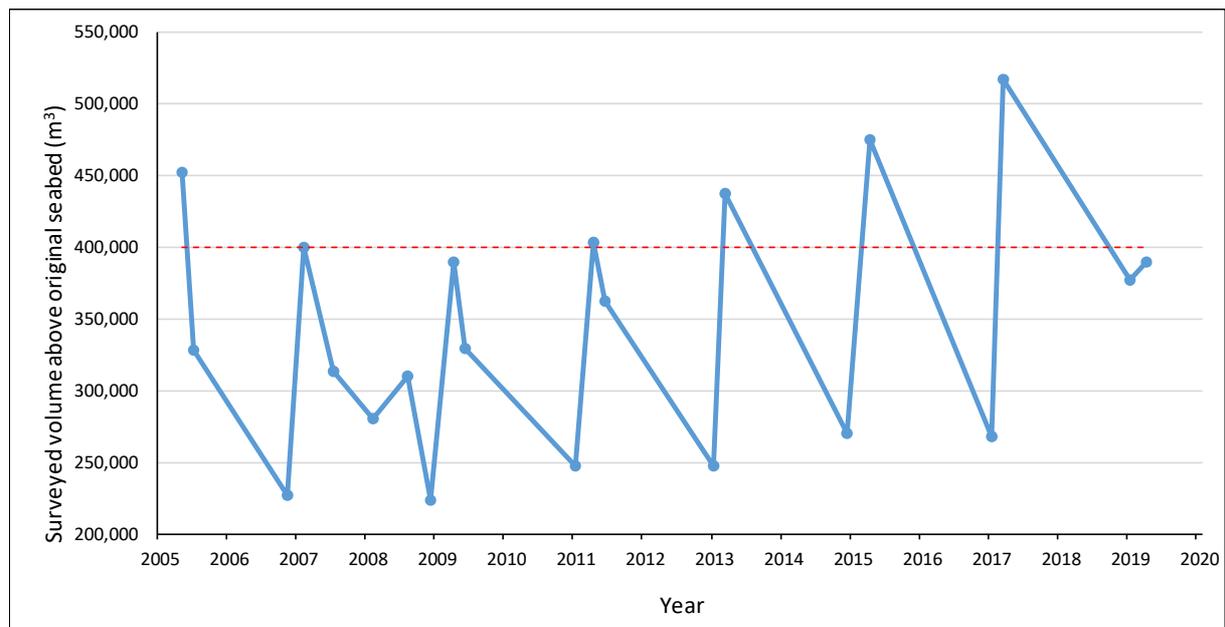


Figure 3 Inshore disposal ground volume above the original seabed (2005 to 2019)

Table 2 Port Taranaki Ltd maintenance dredging volume data summary (2004 – 2019)

Dredging Campaign		Consent 3982-2.1: Dredge removal		Consent 5886-1: Inshore disposal			Consent 3374-2: Offshore disposal	
		<i>In-situ</i> volume removed (m <sup>3</sup> )	Cumulative volume: removed over three campaigns (m <sup>3</sup> )	<i>In-situ</i> sand volume deposited (m <sup>3</sup> )	Cumulative volume: deposited over three campaigns (m <sup>3</sup> )	Final sand volume in dump ground (m <sup>3</sup> )	<i>In-situ</i> sand volume deposited (m <sup>3</sup> )	Cumulative volume: deposited over three campaigns (m <sup>3</sup> )
1	12 Jan 2004 - 23 Mar 2004	343,872	-	253,633	253,633	-	90,239*	-
2	13 May 2005 – 5 July 2005	313,195	-	199,101	452,734	328,493	114,094	-
3	29 Nov 2006 – 19 Feb 2007	307,769	964,836	173,475	626,209	<b>400,294</b>	134,294*	338,627
4 <sup>#</sup>	5 Aug 2008 – 18 Aug 2008	55,761	676,725	29,166	401,742	309,531	26,595*	274,983
5	3 Jan 2009 – 4 April 2009	239,750	603,280	165,995	368,636	389,213	73,755*	234,644
6	18 Mar 2011- 12 May 2011	285,659	581,170	156,086	351,247	361,858	129,573	229,923
7	19 Jan 2013 – 13 Mar 2013	272,334	797,743	189,677	511,758	<b>437,576</b>	82,657	285,985
8	19 Jan 2015 – 23 Mar 2015	210,284	768,277	196,277	542,040	<b>475,245</b>	14,007	226,237
9	8 Jan 2017 – 12 Mar 2017	409,095	891,713	292,661	678,615	<b>517,660</b>	116,434	213,098
10	5 Feb 2019 – 25 Mar 2019	432,200	<b>1,051,579</b>	0	488,938	389,501	432,200	562,641
<b>Consent Limit (m<sup>3</sup>)</b>		<b>570,000</b>	<b>1,045,000</b>	<b>400,000</b>	<b>730,000</b>	<b>400,000</b>	<b>570,000</b>	<b>1,045,000</b>

\*Volume calculations based on an average production rate of 180 m<sup>3</sup>/h

<sup>#</sup>Emergency dredging following a storm event

## 2.2 Receiving environment monitoring

Because the inshore disposal ground was not used during the 2019 campaign, the likelihood of intertidal rocky reef communities being affected by sand disposal was minimal. Nonetheless, monitoring of the receiving environment was still undertaken to assess potential unforeseen effects. Furthermore, undertaking these surveys was beneficial in order to maintain the long term monitoring record and characterise the natural variation that occurs with intertidal sand inundation, ecological diversity and kaimoana populations in the absence of inshore dredge disposal.

### 2.2.1 Intertidal sand inspections

Inspections were carried out before (17 Jan 2019), and during the campaign (20 Mar 2019), and twice the following year when no dredging had occurred (13 Feb 2020, 27 Apr 2020), in order to assess intertidal sand accretion on Kawaroa and Arakaitai Reefs. Photographs were captured from eleven fixed positions during each inspection in order to monitor significant changes sand inundation over time. The aim of inspecting the reefs on these dates was to identify potential effects of the campaign and to differentiate from those of natural processes.

In front and to the west of the Aquatic Centre, most areas of the intertidal reef were predominantly rocky with the exception of breccia platforms covered by *Corallina officinalis* and/or *Hormosira*. The area of reef to the east of the Aquatic Centre was also predominantly rocky in nature, characterised by boulders and breccia covered with *C. officinalis*. Some small pockets of sand were found on the western flank on 20 March 2019 (Figure 4), and a narrow belt of coarse sand and gravel was present at the top of the shore during all inspections. Thin layers of sand were found entrained in patches of *C. officinalis* further down the reef, but the pools were generally clean and free of sand. No significant accumulations of sand were discovered anywhere on Kawaroa Reef over the course of the monitoring period.



Figure 4 Small pocket of sand accumulation on Kawaroa Reef (20 Mar 2019)

A thin belt of coarse sand and gravel was found at the top of the shore on Arakaitai Reef. The volume of this feature appeared to be at its greatest on 20 March 2019, however, it was still much less than what was briefly observed during the previous monitoring period (Figure 5). Thin layers of sand were found entrained in patches of *C. officinalis* and *Xenostrobus pulex* further down the reef, although the pools remained relatively free of sand. Overall, Arakaitai Reef remained predominantly rocky in nature and no significant accumulations of sand were discovered during the monitoring period.



Figure 5 Looking north at Arakaitai Reef from the walkway just west of the groyne; before (17 Jan 2019), and during dredging (20 Mar 2019), the following year (13 Feb 2020, 27 Apr 2020) and during the previous monitoring period (10 Apr 2017)

Overall, Kawaroa and Arakaitai Reefs remained largely free of sand during the 2018 – 2020 monitoring period. No significant build-ups of sand were discovered during any of the four inspections. These findings

indicate that neither natural process, nor offshore sand disposal during the 2019 dredging campaign resulted in any considerable inundation of sand on the intertidal areas of these reefs.

The complete intertidal sand inspection memorandum is available from Council upon request.

## 2.2.2 Intertidal ecological surveys

Intertidal ecological monitoring was undertaken at four sites to ascertain whether there had been any adverse effects on intertidal rocky reef communities as a result of maintenance dredging activities. The surveys were conducted at three potential impact sites, Arakaitai Reef (SEA902045), Kawaroa Reef 750 m north east of Lee Breakwater (SEA902055), Kawaroa Reef 1.2 km north east of Lee Breakwater (SEA902053) and a control site at Greenwood Road (SEA 903070), approximately 20 km south west of Port Taranaki (Figure 6).



Figure 6 Intertidal ecological survey sites

At each site, a 50 m transect was used to establish five 5 m x 3 m blocks. Within each block, five random 0.25 m<sup>2</sup> quadrats were laid giving a total of 25 random quadrats. For each quadrat, the percentage cover of algae and encrusting animal species was estimated using a grid. For all other animal species, individuals larger than 3 mm were counted. Under boulder biota was counted where rocks and cobbles were easily turned over.

It was expected that detectable adverse effects of the dredging activities on the intertidal communities would have been evident as a significant decline in the mean number of species per quadrat (species richness) and mean Shannon-Wiener Index per quadrat (diversity) at the potential impact sites relative to the control site.

No significant differences in species richness or diversity were discovered between sites during the spring 2019 survey. Results showed subtle increases in these metrics across all sites, compared with the previous surveys undertaken in 2017 (Figures 7 & 8). Sand coverage remained very low at three of the four sites, and increased slightly at another (Figure 9). Overall, the results from this survey were not markedly dissimilar from earlier monitoring surveys when the inshore disposal consent had been exercised. Environmental factors, including wave exposure, natural sand movement and habitat complexity appear to be the dominant drivers of species richness and diversity at these intertidal rocky reef sites.

The complete intertidal ecological survey memorandum, including statistical analysis and further discussion of the findings, is available from Council upon request.

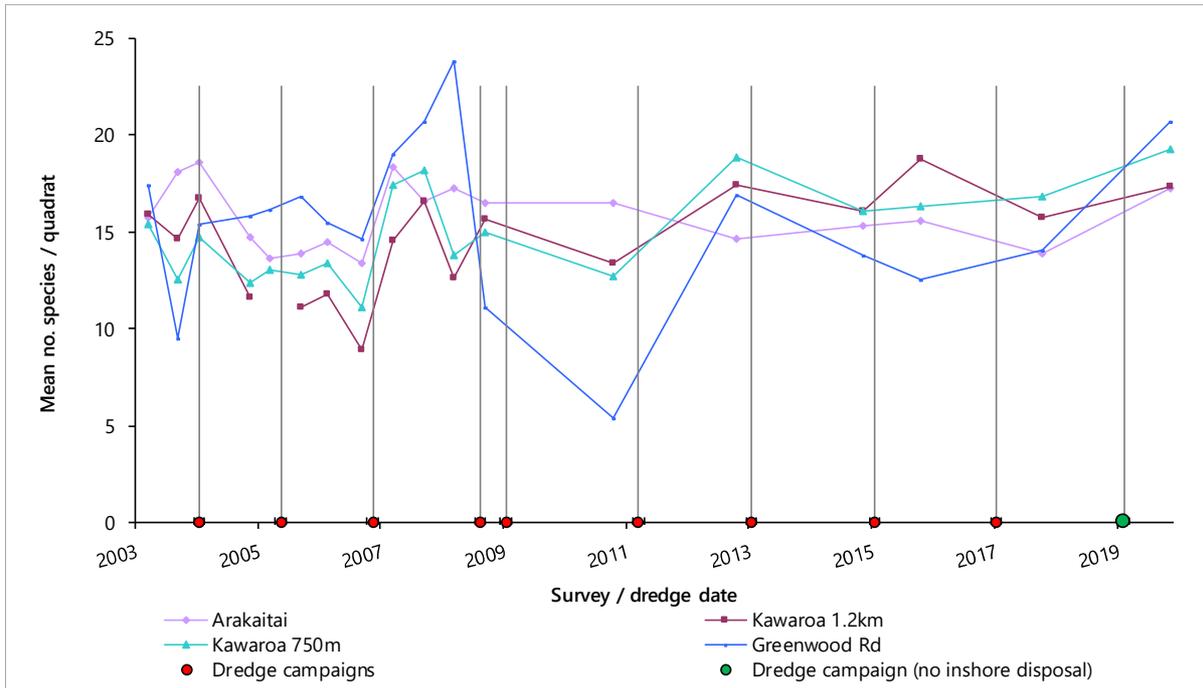


Figure 7 Mean number of species per quadrat at each site from 2003 to 2019

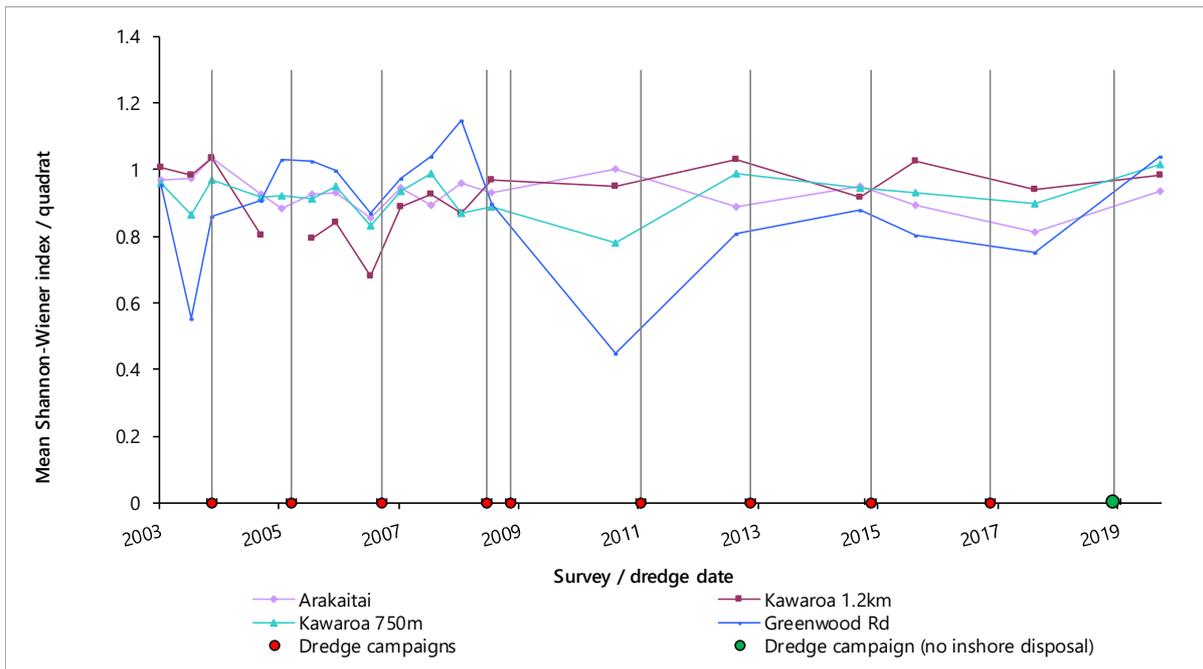


Figure 8 Mean Shannon-Wiener index per quadrat from 2003 to 2019

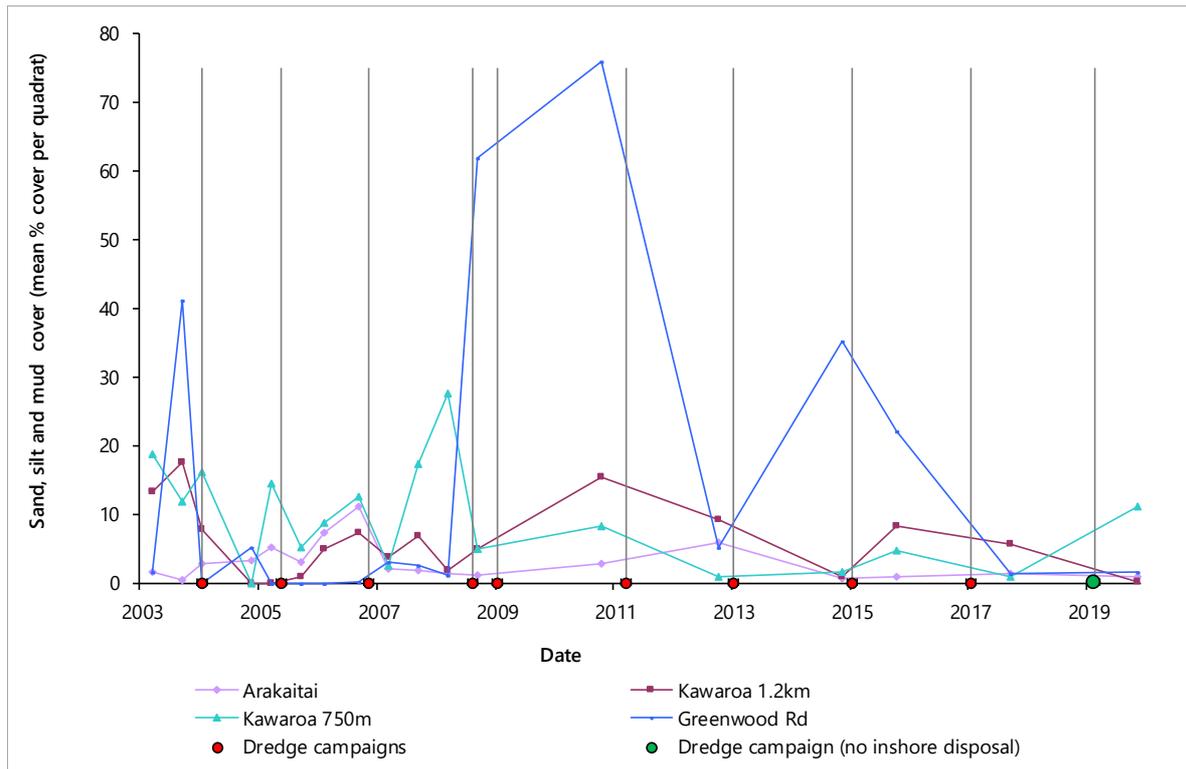


Figure 9 Mean total percentage of sand, silt and mud cover by site from 2003 to 2019

### 2.2.3 Kaimoana surveys

Kaimoana surveys were undertaken at five locally important kaimoana beds on Kawaroa Reef and Arakaitai Reef as identified by Ngati Te Whiti (Figure 10). The inspections included the low intertidal to shallow subtidal, which is not specifically surveyed as part of the intertidal monitoring, but is recognised as being abundant in kaimoana species. The surveys were undertaken to gather information on kaimoana abundance, as well as gaining information on the size frequency of paua.

A 'rapid visual technique' was used in the survey which provides semi-quantitative count data. For each site, all available rocky crevice and under rock habitat was searched for 60 minutes. Within this time interval all paua encountered (*Haliotis iris*, *Haliotis australis* and *Haliotis virginea*) were measured and counted. Other kaimoana species (kina *Evechinus chloroticus* and cooks turban shell *Cookia sulcata*) were also counted, but not measured.

Detectable adverse effects of the dredging activities on kaimoana species were expected to have been evident as a significant decline in paua and kina counts in post-dredging surveys relative to pre-dredging surveys, in addition to a major build-up of sand on the reefs in association with the dredging activities.



Figure 10 Intertidal kaimoana survey sites on Kawaroa and Arakaitai Reefs

Since the kaimoana surveys began in 2003, Kawaroa 3 has had the highest mean count of paua per minute (mean count), followed by Arakaitai, the Lee Breakwater, Kawaroa 1 and 2 (Table 3). Most sites have shown a higher mean count in post-dredge surveys when compared with pre-dredge surveys, with the exception of the Lee Breakwater. The smallest individual paua recorded to date was found at Kawaroa 2 and was 4 mm in length. Similarly small paua (5 mm) have also been recorded at Arakaitai and at the Lee Breakwater. The largest individual paua have been found at Kawaroa 1 and the Lee Breakwater, measuring 110 mm. Kawaroa 2 has the greatest historical mean paua length (52.1 mm), while the Lee Breakwater site has the lowest mean length (43.6 mm). The mean paua lengths recorded in the 2020 survey were greater than the historic mean lengths at every site (Table 3, Figure 12). This difference was most pronounced at the Lee Breakwater site where the 2020 survey mean length was 57.4 mm and the historic mean length was 43.6 mm.

Table 3 Summary paua count data for all surveys (pre and post dredging)

	Lee Breakwater	Kawaroa 1	Kawaroa 2	Kawaroa 3	Arakaitai
Mean count per minute Pre-dredge (3 surveys)	4.0	2.2	2.6	5.1	2.6
Mean count per minute Post-dredge (15 surveys)	3.6	3.1	2.9	5.5	5.8
Mean count per minute All surveys (18 surveys)	3.6	2.9	2.8	5.5	5.2
Minimum size (mm) All surveys	5	10	4	10	5
Maximum size (mm) All surveys	110	110	105	100	95
Mean size (mm) All surveys	43.6	45.0	52.1	49.7	46.6

The paua counts show a general increase at all sites from 2003 to 2007, then a marked decrease between 2007 and 2011 (Figure 11). Paua counts have remained similar at most sites between 2011 and 2020, with Arakaitai recording the most pronounced fluctuations. Although counts have remained similar since 2011, there appears to be a slight decreasing trend at the Lee Breakwater, Kawaroa 1 and 2 sites. Paua counts increased between 2018 and 2020 at Kawaroa 2, 3 and Arakaitai.

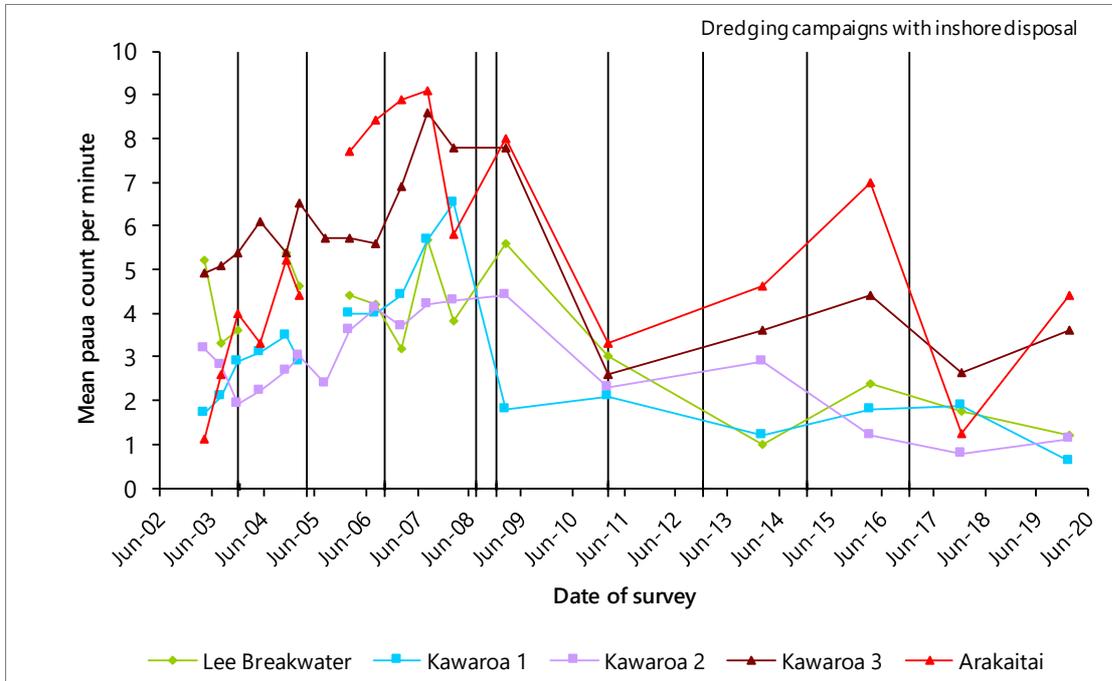


Figure 11 Mean number of paua counted per minute searched during surveys from 2003 to 2020

Mean paua length has typically ranged between 40 to 55 mm at the majority of sites. However, mean length exceeded 55 mm at Kawaroa 2 between 2004 and 2006, at Kawaroa 3 and Arakaitai in 2016, and most recently at the Lee Breakwater and Kawaroa 2 sites in 2020. A uniform decrease in mean paua length across all sites was recorded between 2016 and 2018, followed by a comparable increase between 2018 and 2020.

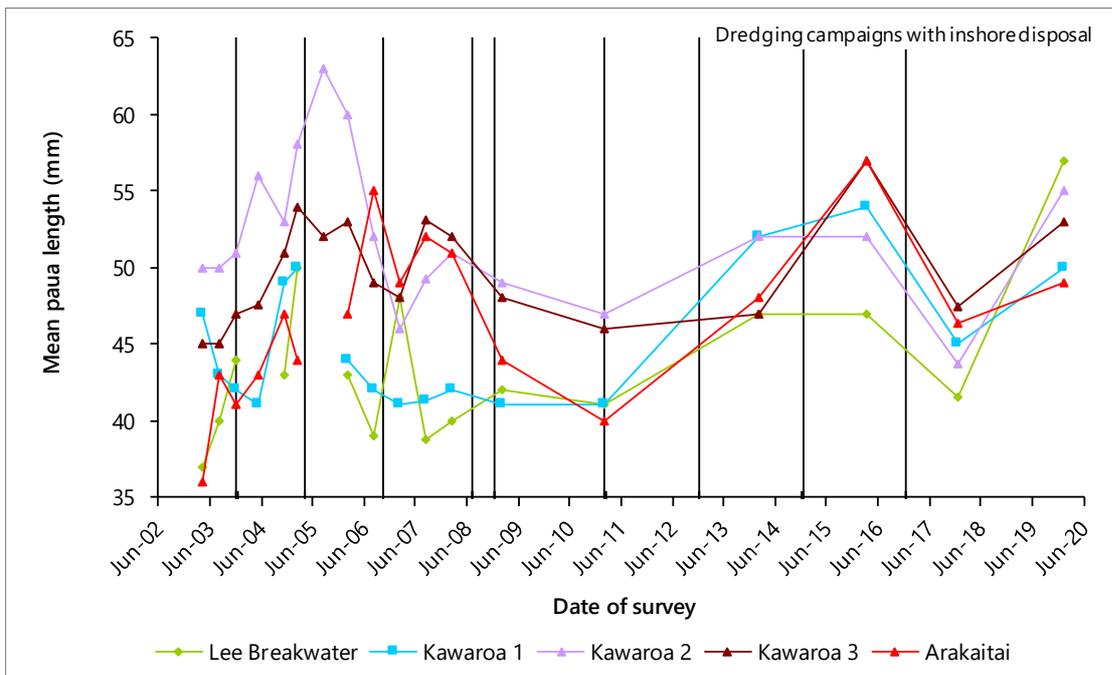


Figure 12 Mean length of paua at the five reef sites during surveys from 2003 to 2020

The Arakaitai Reef and Lee Breakwater sites have shown the least amount of variation in mean kina count per minute since monitoring began, largely due to fewer kina being observed during the surveys (Figure 13). Counts at the three Kawaroa reef sites have been highly variable since the surveys began. However, mean kina counts per minute have remained particularly low at all five sites since 2011 (with the exceptions of the higher counts recorded at Kawaroa 3 in 2014 and 2016). Kina counts have been negligible (<0.2 per minute, or <1 per 5 minutes) at Lee Breakwater, Kawaroa 1 and 2 in 2018 and 2020.

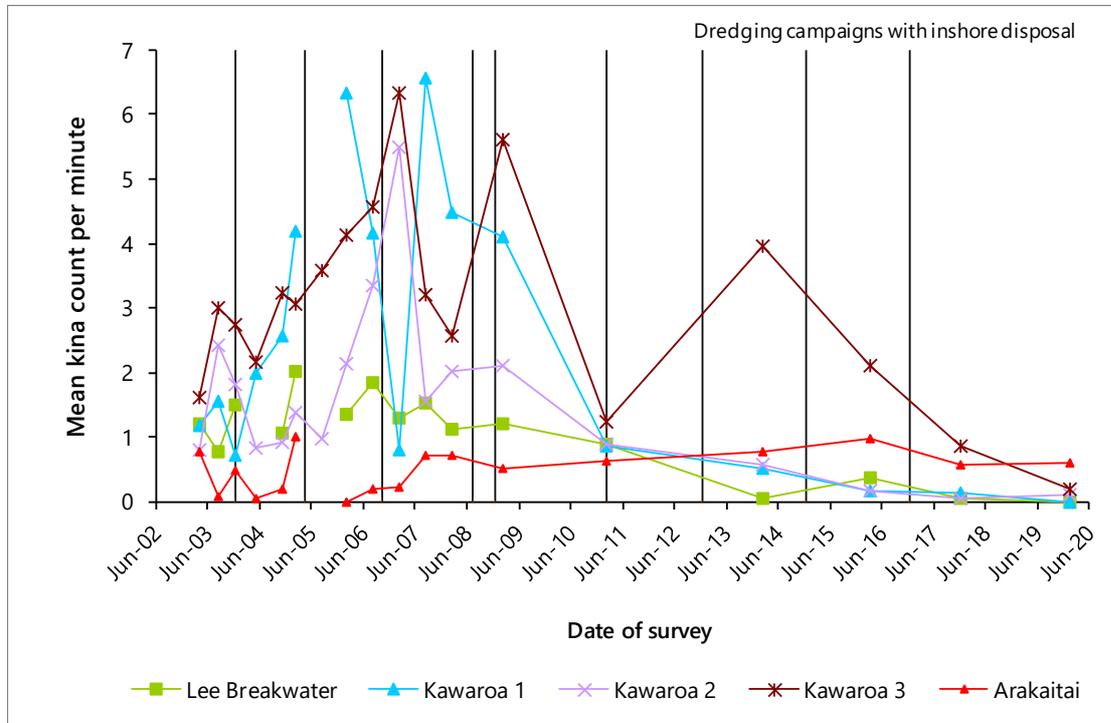


Figure 13 Mean number of kina counted per minute during surveys from 2003 to 2020

There are a number of potential factors that must be considered when interpreting these survey results. Harvesting pressure, recruitment variability, habitat quality and availability due to sand inundation can all directly affect kaimoana populations. On the Taranaki coast, sand movement and inundation is an ongoing natural process, making it difficult to isolate the effects of sand deposition from maintenance dredging. However, the monitoring to date has not identified any occurrences of maintenance dredging campaigns leading to sand inundation on the rocky reef survey sites.

The complete kaimoana survey memorandum, including statistical analysis and further discussion of the findings, is available from Council upon request.

## 2.3 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with the Company. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach, that in the first instance avoids issues occurring, is favoured.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

Table 4 below sets out details of any incidents recorded, additional investigations, or interventions required by the Council in relation to the 2019 maintenance dredging campaign. This table presents details of all events that required further investigation or intervention regardless of whether these were found to be compliant or not.

Table 4 Incidents, investigations, and interventions summary table

Date	Details	Compliant (Y/N)	Enforcement Action Taken?	Outcome
25/03/19	Assessment of campaign data found that the cumulative dredge removal volume limit of resource consent 3982-2.1 was exceeded by 6,579 m <sup>3</sup> (0.6% over).	Y	None. Review of final dredging volume deemed complaint with consent limit (detailed explanation below).	Despite being compliant on this occasion, the Company have signalled that they will be pursuing an application to change conditions in resource consents 3982-2.1 and 3374-2, in order to accommodate the increasing volumes of sediment entering the harbour.

When presented with the Council's initial compliance assessment, the Company disagreed that the dredge removal volume was non-compliant, based on the margin of error associated with the estimate value. The Council agreed that because the exceedance was less than the margin of error associated with the estimate, that this should not be considered non-compliant. A detailed explanation is provided below.

The initial assessment of dredge removal volumes was based on hopper volumes corrected to *in-situ* volumes (using bulking factors applied to the different harbour sediments). This is the same way that the volumes deposited at the two disposal grounds are calculated. However, this is a coarse measurement, and in the context of measuring dredging removal volumes, it is more appropriate for muddy/silty sediments. Whereas, for coarse sandy sediments, pre and post hydrographic surveys are more commonly used to measure dredging removal volumes. In reality, both sandy and muddy sediments are dredged from the harbour, meaning that neither method of measurement is completely appropriate. It has been estimated that approximately 70% of the dredged sediments are from the sand fraction and 30% are from the silt fraction (Atkinson et al. 2001).

Another factor that should be considered when estimating dredging removal volumes is the sediment ingress that can occur between the pre and post hydrographic surveys. Sediment ingress can lead to an underestimation of the actual volume removed from the harbour, due to the additional sediment raising the profile of the seabed for the post survey. The occurrence of natural sediment movement/ingress was demonstrated at the inshore disposal ground during the 2019 dredging campaign as the sediment volume in the ground increased over the course of the campaign despite no dredging sediments being disposed there.

The dredging removal volume estimate for the 2019 campaign, based on the hydrographic surveys, was 400,786 m<sup>3</sup>. On the other hand, the estimate based on the corrected (*in-situ*) hopper volume was 432,200 m<sup>3</sup>. If these values were considered lower and upper estimates, respectively, then the mean value would be

416,493 m<sup>3</sup>, with a margin of error of  $\pm 15,707$  m<sup>3</sup>, or  $\pm 3.8\%$ . This margin of error is greater than the consent limit exceedance, therefore, the Council cannot assess this as being non-compliant.

Despite remaining compliant on this occasion, the Company has acknowledged that have needed to remove greater volumes of sediment from the harbour in recent campaigns, and that they are nearing removal and disposal consent limits, for resource consents, 3982-2.1 and 3374-2, respectively. For this reason, the Company have signalled that they are going to pursue an application to change the conditions in these consents to reflect the increasing rate at which sediment is filling the harbour.

## 3 Discussion

### 3.1 Discussion of dredge campaign

Dredging was undertaken on one occasion during the period July 2018 to June 2020. The dredging and disposal operation commenced on 5 February 2019 and finished on 25 March 2019 (approximately seven weeks in total).

A total *in-situ* volume of 432,200 m<sup>3</sup> of unconsolidated sediment was removed from the main breakwater sandbank, berths and channel. This volume was compliant with the removal volume authorised for a single campaign by resource consent 3982-2.1 (570,000 m<sup>3</sup>). However, the total *in-situ* volume removed from the harbour over the last three campaigns is currently 1,051,579 m<sup>3</sup>, which exceeds the corresponding limit of 1,045,000 m<sup>3</sup> by approximately 0.6%. After discussion with the Company, the Council agreed that this did not constitute a breach in consent limit due to the margin of error associated with the measurement being greater than the exceedance itself (see Section 2.3 for details).

Bathymetric surveying of the residual sand volume within the inshore disposal ground found a volume of 376,765 m<sup>3</sup>; just 23,235 m<sup>3</sup> less than the total allowable volume authorised by resource consent 5886-1 (400,000 m<sup>3</sup>). Due to limited capacity within the inshore disposal ground, the Company could not ensure compliance with resource consent requirements, therefore, it was decided not to exercise this consent. Instead, all dredging sediments were disposed at the offshore ground.

All 432,200 m<sup>3</sup> of the unconsolidated sediment removed from the harbour was disposed at the offshore ground, authorised by resource consent 3374-2. This volume was compliant with the allowable disposal limit for a single campaign of 570,000 m<sup>3</sup>. The total *in-situ* volume of sediment disposed at the offshore ground over the last three campaigns is currently 562,641 m<sup>3</sup>, which is compliant with the corresponding limit of 1,045,000 m<sup>3</sup>.

Following completion of the dredging campaign, the inshore disposal ground was re-surveyed. This was undertaken to gain additional information on the rate of sand movement in and out of the disposal area, in light of the diminishing capacity that has become apparent in recent years (see TRC, 2018). The survey results showed that the volume of sand at the inshore disposal ground had increased by 12,736 m<sup>3</sup> over the seven week duration of the dredging campaign, to a final volume of 389,501 m<sup>3</sup>. This result, along with the growing sand ingress observed within the harbour, suggests that higher volumes of sand are being transported north-east along the coast than what was predicted when these resource consents were originally issued. The Company have signalled that they will apply to change the consent conditions in resource consents 3982-2.1 and 3374-2, in order to reflect the increased rate of sand entering the harbour.

### 3.2 Environmental effects of exercise of consents

Because the inshore disposal ground was not used during the 2019 campaign, the likelihood of intertidal rocky reef communities being affected by sand disposal was minimal. Nonetheless, monitoring of the receiving environment was still undertaken to assess potential unforeseen effects. Furthermore, undertaking these surveys was beneficial in order to maintain the long term monitoring record and characterise the natural variation that occurs with intertidal sand inundation, ecological diversity and kaimoana populations in the absence of inshore dredge disposal.

The intertidal sand inspections found that Kawaroa and Arakaitai Reefs remained largely free of sand during the 2018 – 2020 monitoring period. No significant build-ups of sand were discovered during any of the four inspections. These findings indicate that neither natural process, nor offshore sand disposal during the 2019 dredging campaign resulted in any considerable inundation of sand on the intertidal areas of these reefs.

The intertidal ecological survey found no significant differences in species richness or diversity between sites during the spring 2019 survey. Results showed subtle increases in these metrics across all sites, compared with the previous surveys undertaken in 2017 (Figures 7 & 8). Sand coverage remained very low at three of the four sites, and increased slightly at another (Figure 9). Overall, the results from this survey were not markedly dissimilar from earlier monitoring surveys when the inshore disposal consent had been exercised. Environmental factors, including wave exposure, natural sand movement and habitat complexity appear to be the dominant drivers of species richness and diversity at these intertidal rocky reef sites.

Kaimoana survey results show that most sites have had a higher mean paua count in post-dredge surveys when compared with pre-dredge surveys, with the exception of the Lee Breakwater (Table 3). Paua counts have remained relatively stable since 2011 at most sites, with slight declines apparent at the Lee Breakwater, Kawaroa 1 and Kawaroa 2 sites (Figure 11). Kina counts have been relatively low over the last ten years, with negligible counts recorded at the Lee Breakwater, Kawaroa 1 and 2 sites in 2018 and 2020 (Figure 13). A considerable, uniform increase in paua size was recorded at all sites, from 2018 to 2020 (Figure 12). The mean paua lengths recorded at each site in 2020 were greater than the historic mean lengths for those sites (Table 3, Figure 12). Harvesting pressure, recruitment variability, habitat quality and availability due to sand inundation are all factors that directly affect kaimoana populations. On the Taranaki coast, sand movement and inundation is an ongoing natural process, making it difficult to isolate the effects of sand deposition from maintenance dredging. However, the monitoring to date has not identified any occurrences of maintenance dredging campaigns leading to sand inundation on the rocky reef survey sites.

### 3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 5-7.

Table 5 Summary of performance for Consent 3982-2.1

<b>Purpose: To dredge accumulated sediments from Port Taranaki</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Written notice prior to dredging	Notice received	Yes
2. Dredging of loose sediments only, not bedrock	Information provided	Yes
3. Exercise of consent in accordance with application	Information provided	Yes
4. BPO to minimise environmental effects	Inspections, information provided	Yes
5. Exercise of consent not to effect the recreational use of Ngamotu Beach	No complaints received	Yes
6. Consent holder to keep and maintain records of dredging activities	Information provided	Yes
7. Consent holder to undertake a representative sample of seabed sediments	Samples provided	N/A

<i>Purpose: To dredge accumulated sediments from Port Taranaki</i>		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
8. Option for review of consent	Next scheduled for review in June 2021 if required	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

Table 6 Summary of performance for Consent 3374-2

<i>Purpose: To deposit dredged sediments within an offshore disposal area</i>		
Condition requirement	Means of monitoring during period under review	Compliance achieved?
1. Written notice prior to undertaking activities under	Notice received	Yes
2. Dredging from within Port Taranaki and main shipping channel covered	Information provided	Yes
3. Clean sand deposited at the inshore disposal site	Unable to exercise resource consent 5886-1 due to insufficient capacity within the disposal area	Yes
4. Consent only exercised when impractical to exercise 5886	Unable to exercise resource consent 5886-1 due to insufficient capacity within the disposal area	Yes
5. Consent holder to keep and maintain records of dates, volumes etc.	Information provided	Yes
6. Exercise of permit in accordance with information submitted in application	Information provided	Yes
7. Best practical option		N/A
8. Option for review of consent	Next scheduled in June 2021 if required	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

Table 7 Summary of performance for Consent 5886-1

<b>Purpose: To deposit dredged sediments within an inshore disposal area</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Written notice prior to undertaking activities under consent	Consent not exercised during period under review	N/A
2. Exercise of permit in accordance with information submitted in application	Consent not exercised during period under review	N/A
3. Sand dumped at inshore site restricted to clean sand from outer harbour	Consent not exercised during period under review	N/A
4. Sand disposal limited to 400,000 m <sup>3</sup> minus estimated volume remaining in disposal area	Consent not exercised during period under review due to insufficient capacity within the disposal area	Yes
5. Consent holder to maintain records of disposal, including samples	Consent not exercised during period under review	N/A
6. Water discolouration kept to a minimum	Consent not exercised during period under review	N/A
7. No significant sand inundation on the subtidal area of Kawaroa Reef	Consent not exercised during period under review	N/A
8. No significant adverse ecological effects outside disposal area	Consent not exercised during period under review	N/A
9. No significant adverse ecological effects on kaimoana	Consent not exercised during period under review	N/A
10. Disposal to cease if breach of conditions 7, 8, or 9	Consent not exercised during period under review	N/A
11. Results of all monitoring made publicly available prior to review	Monitoring reports	Yes
12. Review of consent	Next scheduled review June 2021, if required	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>N/A</b>
Overall assessment of administrative performance in respect of this consent		<b>N/A</b>

N/A = not applicable; consent not exercised during monitoring period

Table 8 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement req	Poor
2014	3982	1	-	-	-
	3374	1	-	-	-
	5886	1	-	-	-
2016	3982	1	-	-	-
	3374	1	-	-	-
	5886	1	-	-	-
2018	3982	1	-	-	-
	3374	1	-	-	-
	5886	-	-	1	-
2020	3982	1	-	-	-
	3374	1	-	-	-
	5886	-	-	-	-
Totals		10	0	1	0

During the monitoring period, the Company demonstrated a high level of environmental and administrative performance with the resource consents as defined in Section 1.1.4. All relevant consent requirements were complied with during the 2019 dredging campaign, and no adverse environmental effects were detected.

### 3.4 Recommendations from the 2016-2018 Biennial Report

In the 2016-2018 Biennial Report, it was recommended:

1. THAT in the first instance, monitoring of the consented dredging activities in the 2018-2020 year be amended from that undertaken in 2016-2018, by:
  - a. Implementing a sediment analysis regime (as agreed upon by the Company and the Council), and;
  - b. by requiring the Company to provide a complete dredge campaign compliance summary report to Council as soon as practicable following the campaign, and;
  - c. by reviewing the current kaimoana survey methodology (discussed further in the 2018 survey memorandum)
2. THAT should there be issues with environmental or administrative performance in 2018-2020, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

These recommendations were implemented during the 2018-2020 monitoring period. The sediment analysis regime was not required as the inshore disposal consent was not exercised during the dredging campaign.

### 3.5 Alterations to monitoring programmes for 2020-2022

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;

- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

It is proposed that for 2020-2022 that the monitoring programme remains unchanged from that of 2018-2020. Information reporting requirements and timeframes will be agreed upon between Council and the Company, prior to the 2021 maintenance dredging campaign commencing.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the activity in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2020-2022.

### 3.6 Exercise of optional review of consents

Resource consents 3982-2.1, 3374-2 and 5886-1 provide for optional reviews in June 2021. Conditions eight, eight and 12 (respectively), allow the Council to review the consents, if there are grounds to suggest that the consent conditions are inadequate to deal with any adverse effects on the environment arising from the exercise of the resource consents, which were either not foreseen at the time the application was considered or which was not appropriate to deal with at the time.

Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that there are no grounds that require a review to be pursued or grounds to exercise the review option.

## 4 Recommendations

1. THAT in the first instance, monitoring of the consented dredging activities in the 2020-2022 year remains unchanged from that in 2018-2020.
2. THAT information reporting requirements and timeframes are discussed and agreed upon between Council and the Company prior to commencement of the 2021 maintenance dredging campaign.
3. THAT should there be issues with environmental or administrative performance in 2020-2022, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

## Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Agglomerate	A rock type made of a cemented mixture.
ANZECC	Australia and New Zealand Environment and Conservation Council.
Bathymetric	Measurement of depth in the sea which is used to produce charts and maps of areas of the seafloor.
Biomonitoring	Assessing the health of the environment using aquatic organisms.
Breccia	Rock of angular stones cemented by finer mixture.
Conglomerate	A rock consisting of pebbles and gravel cemented together.
Corraline Pavement	Seabed encrusted with flat coralline seaweeds.
Ecology	Relationship between organisms and their environment.
Gastropod	A snail.
<i>In situ</i>	In the original position.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident register	The incident register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
Intertidal	Between the low water and high water marks.
Invertebrates	An animal that lacks a back bone or spinal column.
Kaimoana	Seafood.
Lahar	Volcanic rock.
Littoral drift	Movement of sediments within the nearshore coastal zone.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
Photosynthetic	Algae use the energy of sunlight to synthesise organic compounds from carbon dioxide and water.
Quadrat	A square metal frame of a known area used to quantify the abundance of organisms within this area.
Qualitative	Relates to the quality or character of what is being surveyed.
Quantitative	Capable of being measured or expressed in numerical terms.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
Revetment wall	Rock boulder wall along the city's foreshore.
RMA	<i>Resource Management Act 1991</i> and including all subsequent amendments.
SCUBA	Self-contained underwater breathing apparatus.

Side Scan sonar	A "fish" is towed behind a boat which sends a signal to the sea floor which is reflected back and recorded. The stronger the echo the harder the substrate is e.g. rock.
Subtidal	The area below the low tide mark.
Transect	Tape run along the shoreline where the random quadrats are taken from.

For further information on analytical methods, contact a Science Services Manager.

## Bibliography and references

- Atkinson, P.N., Black, K.P., Cole, R.G., Dunlop, R. & McComb, P.J., 2001. Port Taranaki Maintenance dredging consent renewal. Report 5: Assessment of environmental effects.
- ANZECC, 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.
- Black, K.P. & McComb, P.J., 2000. Port Taranaki maintenance dredging consent renewal studies. Report 2: Site selection, effects and outcomes. Department of Earth Sciences, University of Waikato.
- Howse, B.P.S., Black, K.P., Cole, R.G., & McComb, P.J., 2000. Port Taranaki Dredging consent renewal studies. Report 3: The relationship of sediment flux to abundance and sizes of paua and kina on New Plymouth reefs. Department of earth sciences, University of Auckland.
- Kelly, S., 2007. Marine Receiving Environment Stormwater Contaminants: Status Report 2007. Auckland Regional Council Technical Publication Number 333.
- McComb, P.J. & Black, K.P., 2000. Port Taranaki Maintenance dredging consent renewal studies. Report 1: Field measurements. Volume 1 – Text. 102p
- McComb, P., 2008. Port Taranaki Nearshore Sand Deposition: monitoring of sand dispersal from the dump site. Report prepared for Port Taranaki Limited by MetOcean Solutions.
- Stuff (2015) <http://www.stuff.co.nz/taranaki-daily-news/news/midweek/69138858/st-pius-x-pupils-influence-dredge-monitoring-in-port-taranaki>
- Taranaki Regional Council, 1999. Westgate Transport Ltd TRK985186 Sand deposition trial monitoring programme report. Technical Report 99-21.
- Taranaki Regional Council, 2006. Port Taranaki Limited Monitoring Programme Monitoring Report 2002-2005. Technical Report 2005-71.
- Taranaki Regional Council, 2009. Port Taranaki Limited Monitoring Programme Monitoring Report 2002-2005. Technical Report 2009-24.
- Taranaki Regional Council, 2014. Port Taranaki Limited Monitoring Programme Monitoring Report 2009-2014. Technical Report 2014-113.
- Taranaki Regional Council, 2016. Port Taranaki Limited Monitoring Programme Monitoring Report 2014-2016. Technical Report 2016-39.
- Taranaki Regional Council, 2018. Port Taranaki Limited Monitoring Programme Monitoring Report 2016-2018. Technical Report 2018-65.
- Taranaki Regional Council (May 2020): *Intertidal sand inspections in relation to the Port Taranaki Limited maintenance dredging programme*. Internal Memorandum MAR1907.
- Taranaki Regional Council (May 2020): *Intertidal ecological survey in relation to the Port Taranaki Limited maintenance dredging programme*. Internal Memorandum MAR1904.
- Taranaki Regional Council (May 2020): *Kaimoana survey in relation to the Port Taranaki Limited maintenance dredging programme*. Internal Memorandum MAR1905.

# Appendix I

## Resource consents held by Port Taranaki Ltd

(For a copy of the signed resource consent  
please contact the TRC Consents department)

### Water abstraction permits

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

### Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

### Air discharge permits

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

### Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

### Land use permits

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Land use permits are issued by the Council under Section 87(a) of the RMA.

### Coastal permits

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Coastal permits are issued by the Council under Section 87(c) of the RMA.

**Coastal Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Port Taranaki Limited  
P O Box 348  
NEW PLYMOUTH

Consent Granted  
Date: 28 January 2002

**Conditions of Consent**

Consent Granted: To deposit up to 570,000 cubic metres in any one dredging campaign, and up to 1,045,000 cubic metres in any three successive dredging campaigns [or any seven-year period what ever comes first], of accumulated sediments removed from the bed of the coastal marine area of the area commonly known as Port Taranaki within an offshore Spoil Disposal Area defined by the Taranaki local circuit grid co-ordinates 283867E-710404N, 283875E-711896N, 285042E-711891N, and 285025E-710431N.... also GR: P19:003-413, P19:015-400, P19:015-413 at or about GR: P19:003-400

Expiry Date: 1 June 2029

Review Date(s): June 2005, June 2009, June 2013, June 2017, June 2021, June 2025

Site Location: Seabed, approximately 1 km north of Port Taranaki, New Plymouth

Legal Description:

Catchment: Tasman Sea

## Consent 3374-2

### General conditions

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### Special conditions

1. The consent holder shall provide written notice to the Chief Executive, Taranaki Regional Council at least 15 working days prior to undertaking any activities under this consent.
2. The exercise of this consent covers both maintenance and capital dredged material from within the confines of the area commonly known as Port Taranaki, and the main shipping channel.
3. Every endeavour shall be made to ensure that clean sand be deposited at the inshore disposal site in accordance with coastal permit 5886 in order to mitigate the effects of the Port and its dredging activities upon the adjacent shoreline.
4. This consent shall only be exercised where for reasons of sediment quality, or operational necessity, it is impractical to exercise coastal permit 5886.
5. The consent holder shall keep and maintain records of all activities under this consent including dates, volumes and origins of all dredged material deposited and a hydrographic survey of seabed depths below chart datum of the spoil disposal area following each dredging campaign, and shall make these records available to the Chief Executive, Taranaki Regional Council, upon request.
6. The exercise of this consent shall be conducted in accordance with the information submitted in support of the application and to ensure that the conditions of this consent are met at all times.
7. At all times the consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with dredging activities.

## Consent 3374-2

8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2005 and/or June 2009 and/or June 2013 and/or June 2017 and/or June 2021 and/or June 2025, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 11 October 2005

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Coastal Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Port Taranaki Limited  
PO Box 348  
New Plymouth 4340

Decision Date  
(Change): 18 March 2015

Commencement Date  
(Change): 18 March 2015 (Granted Date: 28 January 2002)

**Conditions of Consent**

Consent Granted: To remove up to 570,000 cubic metres in any one dredging campaign, and up to 1,045,000 cubic metres in any three successive dredging campaigns (or any seven-year period, what ever comes first), of accumulated sediments from the bed of the coastal marine area of the area commonly known as Port Taranaki

Expiry Date: 1 June 2029

Review Date(s): June 2017, June 2021, June 2025

Site Location: Port Taranaki, New Plymouth

Legal Description: Tasman Sea

Grid Reference (NZTM) 1690011E-5676719N

Catchment: Tasman Sea

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

1. The consent holder shall provide written notice to the Chief Executive, Taranaki Regional Council at least 15 working days prior to undertaking any dredging activities under this consent.
2. The exercise of this consent provides for the maintenance dredging of loose sediments accumulated within the area commonly known as Port Taranaki and the main shipping channel as illustrated in Figure 1 (attached), and does not provide for capital (port deepening) dredging activities, associated with the removal of bedrock.
3. The exercise of this consent shall be conducted in general accordance with the information provided in support of the original application for this consent and with any subsequent application to change consent conditions. Where there is conflict between applications the later application shall prevail, and where there is conflict between an application and consent conditions the conditions shall prevail.
4. At all times the consent holder shall adopt the best practicable option, as defined in section 2 of the Act, to prevent or minimise any actual or likely adverse effect on the environment associated with dredging activities.
5. The exercise of this consent shall not affect the recreational use of Ngamotu Beach.
6. The consent holder shall keep and maintain records of all dredging activities under this consent including samples of dredged material, dates, volumes and hydrographic surveys of seabed depths below chart datum before and after each campaign, and shall make these records available to the Chief Executive, Taranaki Regional Council, upon request.

## Consent 3982-2.1

7. The consent holder shall undertake a representative sample of seabed sediments for chemical analysis including heavy metal concentrations to the satisfaction of the Chief Executive, Taranaki Regional Council, and present the findings at least 6 months prior to provision of review of the consent in June 2009 as provided for in special condition 8 below.
8. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2005 and/or June 2009 and/or June 2013 and/or June 2017 and/or June 2021 and/or June 2025, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 18 March 2015

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**

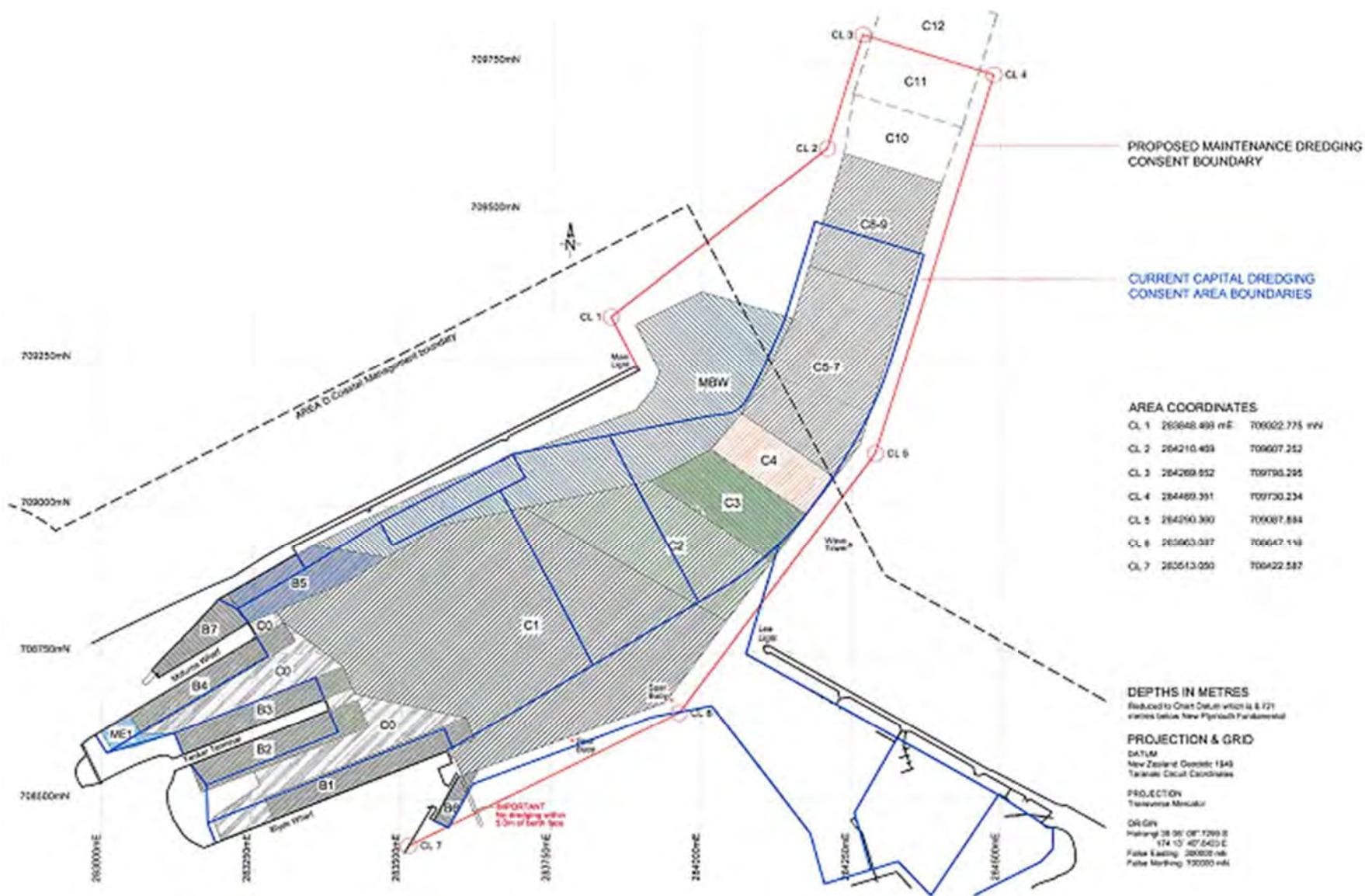


Figure 1: Map of dredging area

**Coastal Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Port Taranaki Limited  
P O Box 348  
NEW PLYMOUTH

Consent Granted Date: 9 April 2002 [by the Minister of Conservation]

**Conditions of Consent**

Consent Granted: To deposit up to 400,000 cubic metres in any one dredging campaign, and up to 730,000 cubic metres in any three successive dredging campaigns [or any seven-year period whichever comes first], of accumulated sands removed from the bed of the coastal marine area from the area commonly known as Port Taranaki, within an inshore disposal area on the western flank of Kawaroa Reef defined by the Taranaki local circuit grid co-ordinates 285638E-710703N, 286045E-710297N, 285133E-709384N, 284726E-709791N, 285575E-710050N, 285816E-710050N, 285335E-709810N, and 285335E-709570N

Expiry Date: 1 June 2029

Review Date(s): June 2005, June 2009, June 2013,  
June 2017, June 2021, June 2025

Site Location: Seabed off Kawaroa Park, Tisch Avenue, New Plymouth

Legal Description: n/a

Catchment: Tasman Sea

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

### **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

### **Special conditions**

- 1) The consent holder shall provide written notification to the Taranaki Regional Council at least 15 working days prior to undertaking the activity licensed by this consent.
- 2) The activity licensed by this consent shall be undertaken in accordance with the information submitted in support of the application and to ensure that the conditions of this consent are met at all times.
- 3) Sand used for the inshore disposal area shall be restricted to clean sand dredged from the outer harbour deposits. No predominantly silty or muddy material dredged from inner harbour areas or from capital dredging shall be deposited.
- 4) Following the initial dredging campaign the annual volume of sand to be disposed shall be limited to 400,000 cubic metres minus the estimated volume of sand remaining in the inshore disposal area from the last campaign to ensure that there is no excessive long term build up of sand in the disposal area authorised by this consent.
- 5) The consent holder shall keep and maintain records of the inshore disposal of clean sands, including samples of deposited material, dates, volumes, and position of clean sands deposited, and forward these records to the Taranaki Regional Council upon the completion of each dredging campaign.
- 6) The consent holder shall undertake all practicable measures to ensure that water discoloration from the disposal is kept to an absolute minimum.
- 7) The exercise of this consent shall not give rise to any significant sand inundation on the subtidal [below Mean Low Water Spring] area of Kawaroa Reef outside of the inshore disposal area.
- 8) The exercise of this consent shall not give rise to any significant adverse ecological effects outside of the area specified as the inshore disposal area on the New Plymouth coast between the Lee Breakwater and the mouth of the Te Henui Stream.
- 9) The exercise of this consent shall not give rise to any significant adverse effects to kaimoana on the New Plymouth coast between the Lee Breakwater and the mouth of the Te Henui Stream.

## Consent 5886-1

- 10) Should there be a breach of conditions 7, 8 or 9 of this consent then the consent holder, shall at the direction of the Chief Executive of the Taranaki Regional Council, immediately cease any sediment disposal authorised by this consent and the consent holder shall not recommence that disposal until so authorised in writing by the Chief Executive of the Taranaki Regional Council.
- 11) The results of all monitoring undertaken in association with this consent shall be made publicly available at least three months prior to the provision of the review of the consent as provided for by special condition 12 below.
- 12) In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2005 and/or June 2009 and/or June 2013, and/or June 2017 and/or June 2021 and/or June 2025, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 10 October 2005

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**