R. N. Barlow and Associates Limited

Trans-Tasman Resources Limited

South Taranaki Bight

Offshore Iron Sand Extraction and Processing Project

Report on the Maritime and Navigational Impacts of the Project

November 2015

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In November 2015 I was provided with a summary of additional scientific work commissioned by TTR since 2014. The conclusions from my report dated August 2013 remain valid in light of TTR's additional information.
Ray Barlow 11 November 2015

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Glossary

AIS	Automatic Identification System
BWM Convention	International Convention for the Control and Management of Ships Ballast Water and Sediments
DP	Dynamic Positioning - a system of maintaining a required position or heading
FPSO	Floating Production Storage and Offloading Vessel
FSO	Floating Storage and Offloading Vessel
HFO	Heavy Fuel Oil 380 Cs
IACS	International association of Classification Societies
IMO	International Maritime Organisation
MARPOL	International Convention for the Prevention of Pollution From Ships
MEPC	Maritime Environment Protection Committee of the IMO
SOLAS	Safety of Life at Sea Convention
SSMS	Safe Ship Management System
TTR	Trans-Tasman Resources Limited
UNCLOS	United Nations Convention on the Law of the Sea

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1. Executive Summary

Navigation Impacts of the project

The mining site in the South Taranaki Bight for which approval is sought is removed from regular marine traffic routes and activities and should not be in conflict with other marine traffic and activities in the area.

Exclusion Zone FPSO Operations

It is intended to apply to Maritime New Zealand to establish an exclusion zone (or an equivalent) around the FPSO when anchored on the mine site to safeguard other ocean users, members of the public and project vessels from harm.

The exclusion zone around the FPSO is unlikely to affect recreational opportunities in the mining area, the Marine Traffic Study indicates that the area is very lightly used by any vessels and the mine site, because of the nature of the sea bed material, is unlikely to support much marine life which would be of interest to recreational fisher or divers. The site is well removed from recreational boating launching and mooring sites.

Maritime Safety

All the major vessels employed on the project will be classed by a member of International Association of Classification Societies (IACS) and be compliant with the Safety of Life at Sea Convention (SOLAS) and all other International Maritime Organisation (IMO) Conventions as well as the Laws of New Zealand, any other smaller vessels will be registered under the New Zealand Safe Ship Management System (SSMS).

Bio security

Ballast Water and Biofouling

Bio security issues associated with the project essentially revolve around the management of ballast water and hull fouling of vessels arriving in New Zealand. All vessels arriving in New Zealand are required to make a 'Ballast Water Declaration' and comply with the 'Import Health Standard for ships ballast water from all countries' issued under Section 22 of the Biosecurity Act 1995 (Appendix 2)

In addition, arriving vessels will be required to meet the 'Craft Risk Management Standard (CRMS) for Biofouling on Vessels arriving to New Zealand' issued under section 24G of the Biosecurity Act 1993. (Appendix 4)

Operational discharges

Normal vessel operational discharges

Operational discharges will comprise of sea water used for cooling machinery and products of combustion from engines and turbines. Sewage and Garbage will be dealt with as required under MARPOL Annex IV and V.

Mining operational discharges from the FPSO

FPSO mining operational discharges will comprise of de-ored sand being replaced on the seabed in areas that have been mined and brine, which is a by-product of the reverse osmosis plant operation, this will be co-mingled with the de-ored sand.

Process operational discharge from the FSO

Process operational discharge from the FSO will comprise of brackish fresh water from the ore washing process.

Oil and oil products

All oils will be retained on board for disposal ashore at an approved facility.

Hazardous materials

Any hazardous materials will be retained on board for disposal ashore at an approved facility.

Ports

The project is likely to use a number of different ports to support the vessels engaged in the project depending on the services required and the method of delivering them. The ports of Wanganui, New Plymouth and Nelson are the closest to the mine site in that order and each may offer the project support in different ways according to their capabilities.

Personnel

TTR intends to incentivise the use of New Zealand citizens or New Zealand residents as employees of the company and its contractors to service the project.

It is envisaged that around 200 positions will be available to operate on marine vessels associated with the project.

It is envisaged that around 50 positions will be available to directly manage and operate TTR's projects on shore. There will be other direct employment effects resulting from TTR's project should it be approved. These will include maintenance and supply operations for the vessels.

2. Navigation Impacts of the project

2.1. Marine Traffic in South Taranaki Bight

A comprehensive study was commissioned from Marico Marine NZ Limited (Marico) into vessel movements in the South Taranaki Bight to establish the impact of the proposed mining project on vessel activity in the area. This is attached as Appendix A.

The study analysed 12 months of Automatic Identification System (AIS) data for the area extending from Cook Strait to Kahurangi Point and Cape Egmont including Tasman Bay.

AIS was developed primarily as a collision avoidance tool. Vessels that carry an AIS transponder broadcast at regular intervals key information such as their position, identity, type, speed, course, etc. AIS exists in two forms, Class A and Class B: the former is fitted in all vessels so mandated by International Maritime Organisation (IMO); the latter on a voluntary basis by non-SOLAS vessels such as recreational craft.

Regulation 19 of SOLAS Chapter V4 - sets out the navigational equipment to be carried on board ships according to ship type. AIS is required to be carried on:

- All ships of 300 and greater gross tonnage and engaged on international voyages;
- Cargo ships of 500 and greater gross tonnage not engaged on international voyages; and
- All passenger vessels irrespective of size.

The Marico study concluded that, the mining area proposed by Trans-Tasman Resources Limited in the South Taranaki Bight is well separated from the nearest regular shipping routes and commercial fishing grounds and should have ‘very little impact, if any, on the safety of navigation in the adjacent areas’.

Figure 1 below shows the cumulative plot of all vessel types over 12 months monitoring of AIS data.

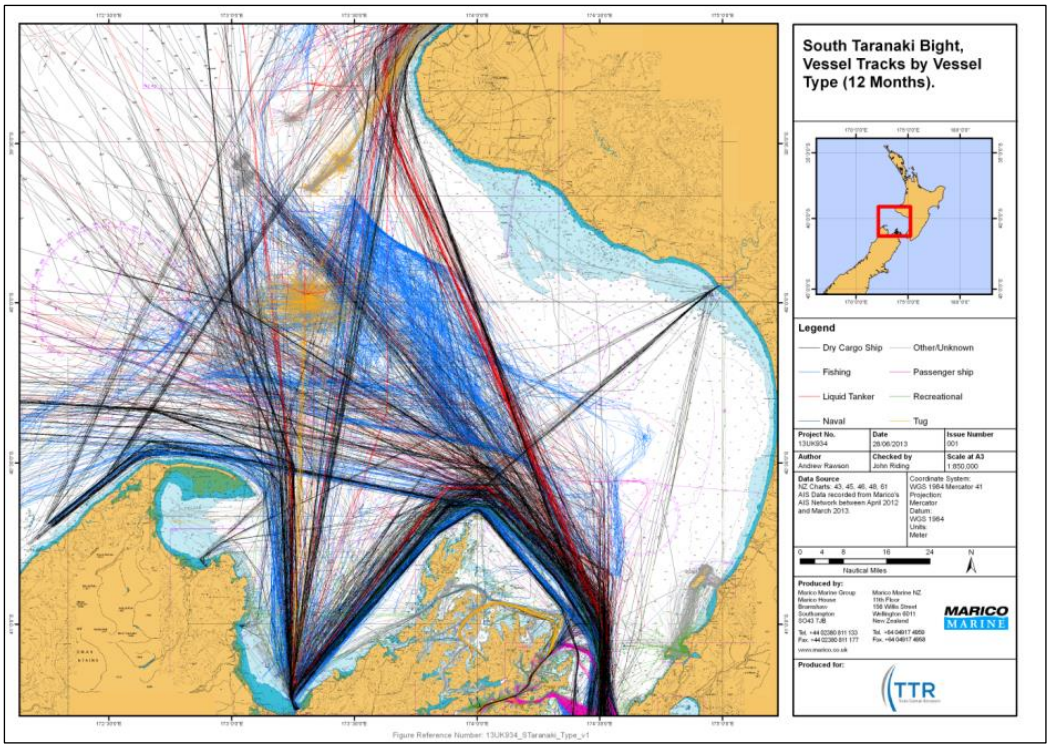

Figure1: cumulative plot of all vessel types over 12 months monitoring of AIS data

2.2. Proximity to Kupe Well Head Platform

The mining operations proposed by TTR will be adjacent and to the south east of the unmanned Kupe Well Head platform, but outside the exclusion zone around this installation and its associated pipelines. Marine activities associated with the platform will be easily accommodated by the mining operations and should not be in conflict.

2.3. TTR vessels' presence

The presence of TTR's manned vessels in the area will supplement the shore based surveillance of the platform's exclusion zone and add to the security of the Kupe operation. TTR's vessels will be equipped with Radar, AIS and an extensive communications suite to detect and communicate with vessels in the area.

2.4. Impacts on Other Marine Operations

Marine traffic in the areas that the project will be conducting these operations is very light, the areas relatively small and the impacts will be minor, if any.

3. Marine Vessel Operations – General Principles

The vessels, management, contractors and crews operating in mining, transporting and supporting the project will be compliant with IMO conventions and New Zealand Law.

It is intended that in addition to being fully compliant, 'best practice' will be the project's operating mantra.

3.1. Marine Vessel Operations – the FPSO

3.1.1. The mining and processing operations are planned to be undertaken continuously 24 hours per day, based on the FPSO which will be moored on a four anchor spread extending up to one nautical mile from the vessel, supplemented by a Dynamic Positioning system to ensure the loads on the mooring system do not exceed design limits.

3.1.2. The FPSO will show the lights and shapes for a vessel restricted in its ability to manoeuvre when at anchor, as required by the Maritime Rule 22.27. Working lights will also be very obvious to other marine traffic as required by Maritime Rule 22.30.

3.1.3. The FPSO will contain significant quantities of HFO. The FPSO's HFO tanks will meet international standards and will comply with the Maritime NZ's and the respective classification society's rules for the containment of fuel, particularly in regard to double containment.

3.1.4. The FPSO will be fitted with an AIS transmitter /receiver to alert traffic to its presence and for the officer of the watch to monitor nearby traffic. The AIS transmission gives position data sourced from GPS and can be monitored from the shore and if combined with mining logs will demonstrate that the vessel's location is in compliance with the consents

3.1.5. The position of each anchor will be marked by a buoy, which will be lit at night.

3.1.6. It is intended that an exclusion zone of one nautical mile radius be set up around the FPSO. This exclusion zone will move to the new location as the FPSO is moved.

3.1.7. The FPSO will move within the anchor pattern as mining and deposition of de-ored sand proceeds and the anchor pattern will be re-laid as extraction is completed in an area.

3.2. Marine Vessel Operations - the FPSO – FSO

3.2.1. The FSO will operate as the transfer vessel between the FPSO and the Export vessel.

3.2.2. The FSO will station itself by dynamic positioning (DP) adjacent to the bow of the FPSO and connect the product transfer hoses to receive the ore slurry.

3.2.3. Whilst approaching and when within the exclusion zone around the FPSO, the FSO will be restricted in its ability to manoeuvre and will show the lights and shapes as required by Maritime Rule 22.27 and 22.30.

3.3. Marine Vessel Operations – the FSO and Export vessel

3.3.1. The transfer operation between the FSO and the export vessel will take place with the export vessel at anchor and the FSO either moored to it or under dynamic positioning in close proximity to the export vessel.

3.3.2. The export vessel will show the lights and shapes required for a vessel at anchor under Maritime Rule 22.30 (1) and (2). The FSO, when transferring cargo and under dynamic positioning will show the lights required by Maritime Rule 22.27, otherwise the lights for a vessel at anchor as required under Maritime Rule 22.30.

3.4. Marine Vessel Operations - Anchor Handling Tug (AHTS)

3.4.1. The AHTS will be used to deploy and move the anchors of the FPSO as required, when doing so it will exhibit the lights of a towing vessel as required by Maritime Rule 22.24.

3.4.2. The AHTS may also be used to transfer stores and equipment to and from other vessels and the shore.

3.5. Marine Vessel Operations – Replenishment vessel

3.5.1. The replenishment vessel will be used to re-fuel the FPSO and the FSO with Heavy Fuel Oil, and supply other stores and spare parts; the fuel transfer will normally be undertaken whilst dynamically positioning alongside these vessels using the RAS method. The AHTS may undertake all or some of these functions.

3.5.2. The replenishment vessel's HFO tanks will meet international standards and will comply with the Maritime NZ's and the respective classification society's rules for the containment of fuel, particularly in regard to double containment.

3.5.3. Whilst replenishment is being undertaken, the replenishment vessel will be restricted in the way it can manoeuvre and show the lights and shapes as required under Maritime Rule 22.27.

3.5.4. Comprehensive operating manuals will be drawn up to manage the fuel transfer operation and a Project Oil Spill Response Plan submitted for approval to Maritime New Zealand.

4. Maritime Safety

4.1. General

4.1.1. All the major vessels employed on the project will be classed by a member of IACS (International Association of Classification Societies) and be compliant with the Safety of Life at Sea Convention (SOLAS) and all other International Maritime Organisation (IMO) Conventions as well as the Laws of New Zealand, any other smaller vessels will be registered under the New Zealand Safe Ship Management System (SSMS).

4.1.2. The vessels will be equipped with navigation equipment, (including charts both electronic and paper) as required by the IMO Conventions and New Zealand Maritime Rules.

4.1.3. The vessels will be equipped with Radar, AIS and an extensive communications suite to detect and communicate with other vessels in their proximity and the shore.

4.1.4. The vessels will be fitted with life-saving equipment as required by the SOLAS Convention and New Zealand Maritime Rules, the crews will be fully trained and competent to operate the life-saving equipment.

4.1.5. The presence of the project vessels in the South Taranaki Bight will be an asset to and enhance any search and rescue operations in the area.

4.1.6. The project will also be serviced by helicopter, which may be available to supplement the current rescue helicopter services in times of emergency.

4.2. Exclusion Zones

4.2.1. It is intended to apply to Maritime New Zealand to establish an exclusion zone, or an equivalent, around the FPSO when anchored on the mine site to safeguard other ocean users, members of the public and project vessels from harm.

4.2.2. The exclusion zone applied for will extend in a circle with a radius of approximately one nautical mile from the FPSO to extend beyond the extremities of the anchor pattern and cover the area where support vessels are manoeuvring and/or are constrained in their ability to manoeuvre.

4.2.3. It is intended that the exclusion zone will be monitored and all movements within the zone will be authorised by the Officer of the Watch on the FPSO.

4.2.4. If authorised by Maritime New Zealand this exclusion zone will be promulgated through Notices to Mariners and noted on Marine charts. Up to date position information of the FPSO will be promulgated to mariners through the vessel's AIS transmissions.

5. Transfer operations

5.1. FPSO to FSO

The FSO will station itself by dynamic positioning (DP) adjacent to the bow of the FPSO and connect the ore/fresh water slurry transfer hoses to receive the ore slurry. The mining operation will continue as the slurry is transferred.

5.2. FSO to Export Vessel

5.2.1. The transfer site for loading the export vessel will be chosen by the Master of the FSO in conjunction with the Master of the export vessel. The transfer site will be contingent on weather conditions at the time and the immediate forecast. It would be expected that the master of the FSO will be pre-eminent in this decision because of better local knowledge.

5.2.2. The transfer site nominated will be advised to Maritime New Zealand by the master of the FSO and a radio navigation warning issued to all vessels of the activity with a request to keep clear. All updates of position and notifications of completion of the operation to Maritime New Zealand will be the responsibility of the FSO master.

5.3. Fuel Transfer

5.3.1. Procedures for fuel transfer operations at sea will be as approved by Maritime New Zealand.

5.3.2. The commencement and completion of fuel transfer operations at sea will be notified to Maritime New Zealand by the Master of the replenishment vessel as required by Maritime Rule 103.

5.3.3. If this is to take place in a Harbour the relevant Harbour Authority will issue a fuel transfer permit as required by their by-laws.

6. Bio security

6.1. General

Bio security issues associated with the project essentially revolve around the management of ballast water and hull fouling.

6.2. Ballast Water

Since the introduction of steel hulled vessels around 120 years ago, water has been used as ballast to stabilize vessels at sea. Ballast water is pumped-in to maintain safe operating conditions throughout a voyage. This practice reduces stress on the hull, provides transverse stability, improves propulsion and manoeuvrability, and compensates for weight lost due to fuel and water consumption.

While ballast water is essential for safe and efficient modern shipping operations, it may pose serious ecological, economic and health problems due to the multitude of marine species carried in ships' ballast water. These include bacteria, microbes, small invertebrates, eggs, cysts and larvae of various species. The transferred species may survive to establish a reproductive population in the host environment, becoming invasive, out-competing native species and multiplying into pest proportions.

Preventing the transfer of invasive species and coordinating a timely and effective response to invasions requires cooperation and collaboration among governments, economic sectors, non-governmental organizations and international treaty organizations. The UN Convention on the Law of the Sea (UNCLOS) provides the global framework by requiring States to work together "to prevent, reduce and control human caused pollution of the marine environment, including the intentional or accidental introduction of harmful or alien species to a particular part of the marine environment."

The International Convention for the Control and Management of Ship's Ballast Water and Sediments 2004 (BWM convention) was adopted by consensus at a Diplomatic Conference held at IMO Headquarters in London on 13 February 2004. NZ is in the process of ratifying the BWM convention with Ministry of Transport and expect the process will be completed in about mid-2014.

The BWM convention requires all ships to implement a Ballast Water and Sediments Management Plan. All ships will have to carry a Ballast Water Record Book and will be required to carry out ballast water management procedures to a given standard. Parties to the BWM convention are given the option to take additional measures that are subject to criteria set out in the BWM convention and to IMO guidelines.

The vessels employed by the project will arrive in New Zealand from an overseas port and will be fully compliant with the requirements of the BWM convention with

'clean' water ballast and 'clean' tanks. In practice the vessels will have exchanged their ballast water in the tropics in deep water as recommended by IMO.

There will be operational ballasting and de-ballasting undertaken by project vessels in the EEZ and in the New Zealand Territorial Sea but this will be exchanging clean New Zealand ballast water.

All vessels arriving in New Zealand are required to make a 'Ballast Water Declaration' and comply with the 'Import Health Standard for ships ballast water from all countries' issued under Section 22 of the Biosecurity Act 1995.

All TTR's export vessels will arrive in New Zealand with compliant water ballast and 'clean' tanks. Ballast water will be pumped out of the export vessel when cargo is loaded as a normal operational discharge as is the case for most vessels loading cargoes in New Zealand waters.

6.3. Hull Biofouling

Vessels arriving in New Zealand will be required to comply with the IMO Biofouling Guidelines 2011 (Resolution MEPC 207(62), '2011 Guidelines for the Control and Management of ship's Biofouling to minimise the transfer of invasive aquatic species'. These guidelines will be enforced through the bio-fouling regulations which are currently being developed by the Ministry for Primary Industries.

The Guidelines include advice on the vessel's Biofouling Management Plan, Biofouling Record Book, Choosing the anti-fouling System, installing, and repairing the anti-fouling system, in water inspection, cleaning and maintenance

In addition arriving vessels will be required to meet the 'Craft Risk Management Standard (CRMS) for Biofouling on Vessels arriving to New Zealand' issued under section 24G of the Biosecurity Act 1993.

These standards will also apply to the export vessels and will be a pre-requisite for vessels uplifting cargoes from the project.

TTR's locally operated vessels will comply with the newly released "Controls for antifouling paints" put out by the EPA

7. Sewage

Sewage wastes will be treated on board the vessels in an approved manner and shipped ashore for treatment and disposal at an approved facility as detailed in the vessels' sewage management plan.

8. Garbage

Garbage will be treated on board the vessels in an approved manner and shipped ashore for treatment and disposal at an approved facility as detailed in the vessels' garbage management plan.

Appendix 1 South Taranaki Bight Marine Traffic Study

Supplied separately from this report.

Appendix 2

IMPORT HEALTH STANDARD FOR SHIPS' BALLAST WATER FROM ALL COUNTRIES

Issued pursuant to Section 22 of the Biosecurity Act 1993 Dated: 13 June 2005

1. REVIEW

The original standard was issued by Ministry of Fisheries in May 1998. It was reviewed to include improved procedures and transition to the format of Biosecurity New Zealand, Ministry of Agriculture and Forestry (MAF) in June 2005.

2. APPLICATION

This import health standard (IHS) applies to ballast water loaded within the territorial waters of a country other than New Zealand and intended for discharge in New Zealand waters. The IHS does not apply to: ballast water that will not be discharged in New Zealand waters; ballast water loaded in New Zealand waters; or emergency discharge of ballast water.

3. GENERAL CONDITIONS

It is the responsibility of the Master of the vessel to ensure that the ballast water and any associated sediment, intended for discharge in New Zealand, comply with the conditions in the standard. Ballast water that does not comply with the conditions must not be discharged in New Zealand waters.

Compliance with these controls must be consistent with the safety of the crew and the vessel. Nothing in these controls is to be read as relieving the Master of their responsibility for the safety of the vessel.

4. DEFINITIONS

Ballast water - water, including its associated constituents (biological or otherwise), placed in a ship to increase the draft, change the trim or regulate stability. It includes associated sediments, whether within the water column or settled out in tanks, sea-chests, anchor lockers, plumbing, etc.

Internal waters - means:

- harbours, estuaries, and other areas of the sea that are on the landward side of the baseline of the territorial sea of a coastal state; and
- rivers and other inland waters that are navigable by ships.

Inspector - an inspector appointed under section 103 of the Biosecurity Act, 1993

Nothing in this standard is to be read as relieving ship masters of their responsibility for the safety of the vessel, passengers and crew.

New Zealand waters - means:
- the internal waters of New Zealand; and
- the territorial sea of New Zealand.

Territorial sea – For New Zealand this is the sea within 12 nautical miles of the seaward side of the baseline of the territorial sea. (See section 3 of the Territorial Sea, Contiguous Zone and Exclusive Economic Zone Act, 1977 for definition of New Zealand baseline)

5. REQUIREMENTS FOR BALLAST WATER

5.1 No ballast water may be discharged into New Zealand waters without the permission of an inspector.

5.2 An inspector will only permit ballast water to be discharged if satisfied that the Master has met one of the criteria in section 6 below.

5.3 Part I of the Vessel Ballast Water Declaration approved by the Ministry of Agriculture and Forestry must be completed for all vessels. It should be completed before arrival in New Zealand and sent accompanying the Advance Notice of Arrival to the Ministry of Agriculture and Forestry Quarantine Service (MAFQS) office at the ship's first port of arrival.

5.4 For vessels indicating intention to discharge ballast in New Zealand, Part 2 of the Ballast Water Declaration must also be completed, except for the columns under Question 3 for Ballast Water Discharged. This should be sent to MAFQS before arrival in New Zealand, along with Part 1, in order for a vessel to be granted permission to discharge ballast water or be granted an exemption.

5.5 Permission to discharge ballast water is granted when an inspector approves the discharge, signs the 'Discharge of ballast permitted' form, and sends this back to the ship. Discharge of ballast is denied when an inspector does not approve the discharge, signs the 'Discharge of ballast denied' form and sends this to the ship.

5.6 Before the ship leaves New Zealand the original of Part 2 must be completed with details of the discharge in New Zealand. The original signed declarations must be kept on board while in New Zealand. In addition the copy faxed or emailed from MAFQS to the ship detailing the MAFQS direction to the vessel must also be retained. These are uplifted by MAFQS at the last port of call in New Zealand.

5.7 Sediment which has settled in ballast tanks, ballasted cargo holds, sea-chests, anchor lockers or other equipment must not be discharged into New Zealand waters. If the ship needs to discharge sediment in New Zealand, the sediment must be landed and taken to a landfill approved by an inspector.

6. OPTIONS FOR SATISFYING AN INSPECTOR

Option 1

Demonstrating the ballast water has been exchanged en route to New Zealand in areas free from coastal influences, preferably 200 nautical miles from the nearest land and in water over 200m in depth. Accepted techniques are either emptying and refilling ballast tanks/

holds with an efficiency of 95% volumetric exchange or pumping through the tanks a water volume equal to at least three times the tank capacity. Tanks should be pumped no more than two at a time and, if two tanks are pumped together, they should be a symmetrical pair of tanks to ensure the safety of the vessel.

Option 2

Demonstrating the ballast water is fresh water (not more than 2.5 parts per thousand sodium chloride).

Option 3

Ballast water has been treated using a shipboard treatment system approved by MAF.

Option 4

Ballast is discharged in an onshore treatment facility approved by MAF.

Note - there are presently no treatment systems or facilities approved by MAF for the purposes of options 3 and 4.

7. EXEMPTIONS

It is accepted that in some circumstances exchange may not be possible. Exemptions are granted by the same process as granting permission to discharge. An exemption will generally be granted when it can be demonstrated that:

Exemption 1

- The weather conditions on the voyage in combination with the construction of the vessel have precluded safe ballast water exchange; and
- the ballast water was not loaded in any area listed in Annex 1.

Exemption 2

- The construction of the vessel has precluded ballast water exchange; and
- the ballast water was not loaded in any area listed in Annex 1.

In the case of weather conditions or vessel construction precluding the safe exchange of ballast water from Annex 1 areas, the vessel must either redistribute the ballast water around the ship's ballasting spaces in order to load cargo or, if this is not possible to accomplish with a suitable margin of safety, the ship must leave New Zealand without loading some, or all, intended cargo. Exempted vessels are asked to discharge the least amount of ballast water possible and discharge as far offshore as practicable.

8. COSTS

The costs of inspection, analysis, identification, delays, and any other costs associated with this standard are the responsibility of the owner and/or charterer. These costs shall be actual, fair and reasonable.

9. ENQUIRIES

Unless indicated to the contrary on communications, enquiries concerning this IHS should be addressed to:
Team Manager, Border Standards
Biosecurity New Zealand
Ministry of Agriculture and Forestry
PO Box 2526
Wellington
NEW ZEALAND
FAX: 64 - 4 - 498 9888

10. OFFENCES AND PENALTIES

Providing incorrect information to an inspector is an offence under the Biosecurity Act, 1993 section 154(b). It carries a penalty for individuals of up to 12 months imprisonment and/or a fine not exceeding NZ$50,000, and for corporations a fine not exceeding NZ$100,000. Failure to obey the directions of an inspector is an offence under section 154(o). It carries a penalty for individuals of a fine not exceeding NZ$5,000, and for corporations a fine not exceeding NZ$15,000.

11. OBTAINING INFORMATION

Ship masters should communicate with MAFQS inspectors prior to their arrival in New Zealand waters to determine requirements or discuss their options if permission has been denied (these may include carrying out an exchange and resubmitting a new declaration).
Communications should be directed to the MAFQS office at the intended port of arrival or one of the following: MAF Quarantine Service
CPO Box 39
Auckland
Phone - (09) 303 3423
FAX - (09) 303 3037
Group Leader – 0272 924 820

MAF Quarantine Service
PO Box 3042
Wellington
Phone - 04) 473 8996
FAX - (04) 473 2079
Operations Manager 0274 361 345

MAF Quarantine Service
Private Bag 4765
Christchurch
Phone - (03) 328 7166
FAX - (03) 328 7186

BALLAST WATER DECLARATION: PART 1

TO BE COMPLETED FOR ALL VESSELS ARRIVING IN NEW ZEALAND

Vessel's Name:	Arrival Date:	Arrival Port:	Inspector's Name:

BALLAST WATER

1	**Are you carrying ballast water?**	☐ YES ☐ NO	**If NO go to question 5**
2	**List any tanks loaded with ballast water in Port Phillip Bay, Victoria or Tasmania.**		**List Each Tank Number and Type (see codes below):**
3	**How will you comply with NZ's ballast water controls. (See NZ Import Health Standard for Ballast Water from all Countries.) Check the box indicating how you will comply**		**(A, B or C) below.**
	A. Not discharging any ballast water in New Zealand waters.	☐	
	B. Exchanging the ballast water mid-ocean in all tanks that are to be discharged in New Zealand waters. Indicate whether flow-through or empty/refill technique was used. Note: Flow-though requires 3 times the tank capacity to be pumped through the tank.	☐	**Flow-through ☐ or Empty/refill ☐**
	C. Discharging only fresh water. State when and where the water was loaded.	☐	**Date loaded:** **Port or Position:**
4	**If you cannot comply, check the box (A &/or B) indicating the reason(s). Give details.**		
	A. Vessel is not physically capable of either empty/refill or flow-through exchange	☐	**Specify Details:**
	B. Exchange would have caused unacceptable risk to crew or vessel due to weather conditions	☐	**Specify Details:**

CLEANING: SEDIMENTS

5	**Do you intend to discharge sediment or other debris from ballast tanks/holds (excluding normal deballasting), anchors, chains or chain lockers in New Zealand waters? If YES, state when and where.**	☐ YES ☐ NO	**Date:** **Port or Position:**
	Please note that sediments must be discharged into an approved landfill.		

CLEANING: HULL FOULING

6	**When and where was the vessel last dry-docked and cleaned?**		**Date:** **Port or Position:**
7	**Has the vessel been laid-up for 3 months or more since it was last dry-docked and cleaned? If YES, state when and where.**	☐ YES ☐ NO	**Date: Started:** **Date: Finished:** **Port or Position:**
8	**Do you intend to clean the hull of the vessel in New Zealand? If YES, state when and where.**	☐ YES ☐ NO	**Date:** **Port or Position:**

Ballast tank codes: Upper=U, Lower=L, Forepeak=FP, Aftpeak=AP, Double Bottom=DB, Deep Tank=DT, Wing Tank=WT, Topside=TS, Cargo Hold=CH, Other (specify), Port=P, Starboard=S, (eg 3UWTP):.

MASTER'S NAME AND SIGNATURE:	MAF's directions to vessel:-	INSPECTOR'S SIGNATURE:		
	☐ **Vessel not discharging** (Contact MAF if intentions change)	☐ **Discharge of ballast permitted**	☐ **Discharge of ballast denied** (Contact MAF to discuss options)	☐ **Exemption granted** (This voyage only)

New Zealand Ministry of Fisheries. Pursuant to section 22 of the Biosecurity Act 1993. Revised April 2004

BALLAST WATER DECLARATION: PART 2

TO BE COMPLETED FOR ALL VESSELS DISCHARGING BALLAST WATER IN NEW ZEALAND

1. VESSEL INFORMATION	Vessel's Name:	IMO Number:	Vessel's Call Sign:
Flag:	Vessel's Owner:	Vessel's Agent: PHOENIX SHIPPING	Gross Tonnage (MT):
Type of Vessel: ☐ Bulk ☐ Container ☐ Tanker ☐ RORO/Cars ☐ Fishing		Other(specify) Date Built:	Ballast pumping capacity : Pump A Pump B
Total Number of Ballast Tanks On Board Vessel:	Total Ballast Capacity (specify units):		
2. THIS VOYAGE	Date of Arrival in New Zealand:	Arrival Port:	Last Overseas Port:
	Date of Departure from New Zealand:	Departure Port:	Next Overseas Port:
Total Number of Tanks in Ballast on Arrival in New Zealand:		Total Ballast Volume on Arrival in NZ (specify units; m3, MT):	

3. BALLAST WATER DISCHARGED IN NEW ZEALAND (If none, go to bottom of page) — TICK HERE IF THIS SECTION IS A CONTINUATION OF ANOTHER FORM ☐

IMPORTANT:
List the original **BALLAST WATER SOURCE(s)** for ballast taken on in countries other than **New Zealand**.
All tanks discharged in New Zealand that contained any ballast from another country prior to any exchange must be listed. Detail each ballast management operation for tanks listed.

TANK NO. and TYPE (see codes below)	BALLAST WATER SOURCE AT COMMENCEMENT OF VOYAGE				BALLAST WATER EXCHANGED (E/R = Empty then Refill F/T = Flow Through)					BALLAST WATER DISCHARGED		
	DATE LOADED (DD/MM/YY	PORT or LAT./LONG.	VOLUME LOADED (specify units)	FINAL VOLUME IN TANK (specify units)	E/R or F/T	START DATE FINISH DATE (DD/MM/YY)	START TIME FINISH TIME (HH:MM)	START LAT. LONG FINISH LAT. LONG.	VOLUME FLOWED THROUGH or being EXCHANGED (specify units)	DATE DISCHARGED	PORT or LAT./LONG.	VOLUME DISCHARGED (specify units)

Ballast tank codes: Upper=U, Lower=L, Forepeak=FP, Aftpeak=AP, Double Bottom=DB, Deep Tank=DT, Wing Tank=WT, Topside=TS, Cargo Hold=CH, Other (specify), Port=P, Starboard=S, (eg 3UWTP).

MASTER'S NAME AND SIGNATURE:

New Zealand Ministry of Fisheries. Pursuant to section 22 of the Biosecurity Act 1993. Revised April 2004

Appendix 4 CRAFT RISK MANAGEMENT STANDARD

Craft Risk Management Standard

For Vessel Biofouling

Short Name: CRMS - BIOFOUL

Issuing Authority

This standard is issued under section 24G of the Biosecurity Act 1993 (the Act).

It commences in four years on the day and month of signature below *.

Dated at Wellington this day of 20 _ _

Peter Thomson

Director, Plants, Food and Environment
Standards Branch, Ministry for Primary Industries (MPI)
(Issued under delegated authority)

*
The four year lead-in period before commencement of enforcement of this standard is intended to allow shipping, and other vessel operators, time to make any adjustments needed to their hull maintenance regimes. It is also expected that during this time other jurisdictions will implement clean hull requirements and also that technology for acceptable in-water hull cleaning and provision of hull cleaning services will have developed to the extent that most vessels will be compliant when it comes in to force. Towards the end of the four year period, MPI will review the current hull maintenance practices and other factors to check that the expected improved environment for enforcing the standard has eventuated.

Voluntary compliance is encouraged during the lead-in period. MPI will monitor indicators of each arriving vessel's hull cleanliness through mandatory questions in the advance arrival information. These questions must be answered and false declaration can lead to prosecution under the Act. The information collected will used for the review.

Note: see Guidance Document for explanatory information

Ministry for Primary Industries
P.O Box 2526, Wellington 6011
New Zealand

For all matters relating to the interpretation, review and amendment of this standard, please contact:

Biosecurity and Environment Group
Ministry for Primary Industries
PO Box 2526
Wellington 6011
New Zealand

Phone: 0800 008333

Email: standards@mpi.govt.nz

For all matters relating to the operation of this standard, including inspections, audits and treatments, please contact MPI at your port of arrival. See listed at

http://www.biosecurity.govt.nz/regs/ships/ports-first-arrival

This Standard is accessible on: (*hyperlink to be inserted*)

www

Amendment record:

Table of Contents

INTRODUCTION

Vessel biofouling is a major pathway for the introduction of non-indigenous marine organisms into New Zealand territorial waters, some of which may be harmful to New Zealand resources, economy, environment, and/or people's health and well being. This CRMS manages the risk of introduction into NZ territory and surrounding waters of harmful organisms associated with arriving vessels.

BIOSECURITY REQUIREMENTS – VESSELS ARRIVING TO NEW ZEALAND

This standard applies to any vessel, which arrives into New Zealand territory, meaning a vessel that will anchor, berth or be brought ashore after a voyage originating outside New Zealand's Territorial Sea.

The risk to be managed is the introduction into New Zealand of harmful organisms carried as biofouling on the submerged or periodically submerged parts of the hull.

Outcome Statement:

The outcome of this standard is **to minimise the entry into New Zealand of those harmful organisms that constitute vessel biofouling[1] or are harboured in the biofouling[2].**

Requirements:

A vessel must arrive in New Zealand with a 'clean hull'.

'Clean hull' means that no biofouling of live organisms is present other than within the thresholds below.

'Clean hull' thresholds:

The following criteria are used in assessing whether a vessel has a 'clean hull' according to vessel category. There are two different vessel categories and applicable biofouling allowances – for 1) long-stay vessel and 2) short-stay vessel. The vessel category applies to a vessel for its entire visit to New Zealand (from time of arriving to time of departing NZ territory.

The meaning of 'hull' (including various hull parts in Table 1 and 2) is given in the Appendix.

a) 'Long-stay vessels' means those vessels intending to remain in New Zealand for 21 days or longer and/or visit areas other than those designated under section 37 of the Act as 'Places of First Arrival'.

Table 1: Biofouling Allowances for Long-Stay Vessels

Hull part	Allowable biofouling
All hull surfaces	Slime layer;

[1] Such as algae, barnacles, mussels and oysters
[2] Such as free living worms, sea-stars, fish or shrimps

	Goose barnacle

b) 'Short-stay vessels' means those vessels intending to remain in New Zealand for 20 days or less and to only visit places designated under section 37 of the Act as 'Places of First Arrival'. These vessels generally remain under 'biosecurity surveillance' while in New Zealand territory rather than becoming fully cleared of risk goods.

Table 2: Biofouling Allowances for Short-Stay Vessels

Hull part	Allowable biofouling
All hull surfaces	Slime layer; Goose barnacles.
Wind and water line	Green algae growth of unrestricted cover and no more than 50 mm in frond, filament or beard length; Brown and red algal growth of no more than 4 mm in length; Incidental (maximum of 1%) coverage of one organism type of either tubeworms, bryozoans or barnacles, occurring as: ▪ isolated individuals or small clusters; and ▪ a single species, or what appears to be the same species.
Hull area	Algal growth occurring as: ▪ no more than 4 mm in length; and ▪ continuous strips and/or patches of no more than 50 mm in width. Incidental (maximum of 1%) coverage of one organism type of either tubeworms, bryozoans or barnacles, occurring as: ▪ isolated individuals or small clusters that have no algal overgrowth; and ▪ a single species, or what appears to be the same species.
Niche areas	Algal growth occurring as: ▪ no more than 4 mm in length; and ▪ continuous strips and/or patches of no more than 50 mm in width. Scattered (maximum of 5%) coverage of one organism type of either tubeworms, bryozoans or barnacles, occurring as: ▪ widely spaced individuals and/or infrequent, patchy clusters that have no algal overgrowth; and ▪ a single species, or what appears to be the same species; and Incidental (maximum of 1%) coverage of a second organism type of either tubeworms, bryozoans or barnacles, occurring as: ▪ isolated individuals or small clusters that have no algal overgrowth; and ▪ a single species, or what appears to be the same species.

Refer to the guidance document for illustrations and photo examples of the biofouling allowances.

ACCEPTABLE MEASURES FOR MEETING THE STANDARD

One of the following measures must be applied to achieve the outcome:

i. Cleaning before visit to New Zealand (or immediately on arrival in a facility approved[3] by MPI within 24 hours of arrival) – All biofouling must be removed from all parts of the hull and this must be carried out less than 30 days before arrival to New Zealand.

ii. Continual Maintenance using best practice including:- regular application of antifoul coatings; operation of marine growth prevention systems on sea-chests; and in-water inspections with biofouling removal as required. Following the IMO Biofouling Guidelines[4] is recognised as an example of best practice.

iii. Application of Approved Treatments[5]. Treatments are approved and listed under the Approved Biosecurity Treatment Standard MPI-STD- ABTRT

As an alternative a vessel operator may submit, for MPI approval, a Craft Risk Management Plan (which includes steps that will be taken to reduce risk to the equivalent degree as meeting the requirements of this standard).

Refer to the Guidance Document for information on: how to apply for approval of treatments, requirements for approval of treatments, and list of generally available approved treatments and for examples of evidence of measures i to iii that can be presented on arrival to expedite clearance.

COMPLIANCE

An operator, or the person in charge of a vessel, must take all reasonable steps to comply with this standard. Any vessel that does not meet the requirements of this standard is likely be directed under section 32 or 33 of the Act to take action to mitigate the risk and, if mitigation measures cannot be taken, is likely to be directed to leave New Zealand.

Deliberate non-compliance with the requirements of this standard or negligence leading to non-compliance will lead to increased intervention regimes (e.g. inspections or audits) and/or serving of a compliance order and/or prosecution of liable parties under the Act.

BIOFOULING INFORMATION

The following information is to be provided to MPI prior to arrival (via the Advanced Notice of Arrival)

- Intended length of stay within New Zealand territory and intentions in respect of places to be visited

[3] Means approved as a transitional facility under section 39 of the Act

[4] The current version, including templates for biofouling management plans and records, can be read on MPI's website here http://www.biosecurity.govt.nz/files/enter/ships/2011-imo-biofouling-guidelines.pdf. The Guidelines are available for purchase from the IMO. The English language version has the following reference: I662E ISBN 978-92-801-1545-1

[5] 'Approved Treatment' includes any treatment or other means for meeting the outcome of standard that has received MPI approval.

- Whether the vessel has spent an extended period mainly stationary in a single location. If so, the location and duration of the most recent occurrence of such a stay.
- If the vessel is coming in to undergo biofouling cleaning on arrival, any formal arrangement for cleaning or treatment that will be undertaken immediately upon arrival
- What measures have been or will be used to meet the requirements of the standard, or
- Whether the operator has chosen to operate an MPI approved Craft Risk Management Plan (CRMP) as an alternative to meeting the requirements of the standard (See section 2.5, Approved Treatments, in the Guidance Document for explanation of CRMPs).

The following information (if relevant) must be held on the vessel and provided to MPI in an appropriate form if requested. (This is in addition to information to be provided prior to arrival).

- Information on the antifouling regime and any marine growth prevention systems used. If applying the IMO Biofouling Guidelines, a biofouling management plan showing the hull maintenance and inspection regime and the records kept, preferably consistent with the template in the IMO guidelines[6].
- If applicable to the vessel, its latest International Anti-fouling System Certificate or International Anti-fouling System Declaration,
- Date and reporting from the latest hull biofouling inspection (undertaken either on land or in-water) that was initiated by the vessel operator.

Appendix - TERMS & DEFINITIONS

The following terms and definitions apply to this Standard. Other terms used are as per the Biosecurity Act 1993.

algal growth
Growth of algae that is visible to the naked eye. Algae may be either single celled filamentous forms or multi-celled macroalgae (seaweed) species and includes coralline algae.

biofouling
The accumulation of aquatic organisms such as micro-organisms, plants and animals on surfaces and structures immersed in or exposed to the aquatic environment.

goose barnacles
Also called stalked barnacles or gooseneck barnacles, goose barnacles are ubiquitous foulers of tropical, subtropical and temperate seas, with a wide oceanic distribution that includes attachment to drift wood, floating plant debris and vessel hulls, as well as turtles and whales.

[6] The current version, including templates for biofouling management plans and records, can be read on MPI's website here http://www.biosecurity.govt.nz/files/enter/ships/2011-imo-biofouling-guidelines.pdf. The Guidelines are available for purchase from the IMO. The English language version has the following reference: I662E ISBN 978-92-801-1545-1

harmful organisms
Organisms that may cause unwanted harm to natural and physical resources or human health in New Zealand

hull
The immersed (including occasionally immersed) surfaces of a vessel including the following three parts. Includes pontoons.

> **hull area**
> The immersed surfaces of a vessel excluding niche areas and wind/water line.
> **niche areas**
> Areas on a vessel hull that are more susceptible to biofouling due to different hydrodynamic forces, susceptibility to coating system wear or damage, or being inadequately, or not, painted, e.g., sea chests, bow thrusters, propeller shafts, inlet gratings, dry-dock support strips, etc. Includes appendages.
> **wind and water line**
> The area of the hull that is subject to alternating immersion due to a vessel's movement or loading conditions (also known in shipping as the Boot-top).

IMO
International Maritime Organisation

New Zealand's Territorial Sea
Is the sea bounding New Zealand out to 12 nautical miles from an internal baseline as described in the Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977

slime layer
A layer of microscopic organisms, such as bacteria and diatoms, and the slimy substances that they produce.

vessel or sea-craft
Is a subset of 'craft' as defined by the Act and means every description of boat or other craft used in water navigation, whether or not it has any means of propulsion; also includes: a barge, lighter, hovercraft or floating drilling rig. It does not include aircraft.

vessel operator
Operator of a vessel, either the master or skipper or a land-based ships' operations manager.

Appendix 5

Captain Ray Barlow MNI

Qualifications

Master Mariner (1st Class) Certificate

Experience

Port Operations Management
Successfully operating a surge affected port
Pilotage
Towage
Contracting
Nautical Advice
HSE Management in Port and Marine environment
HR and Industrial Relations
Specialties:

Petro chemical terminals
Offshore support operations
Dynamic under keel clearance
Waterfront labour relations
Oil Spill Response planning
Harbour Towage
Tug and Launch design choice and construction supervision
Container Terminal development and management
Port Planning and optimisation
Ship motions and their affects on safe operations in shallow water
Port and Marine Safety Management

Positions Held

Chairman Global Air And Water Limited

May 2011 – Present (2 years 4 months)

Infection Control and bio security programmes
Health and Phyto sanitary solutions. Food Safety Solutions

Principal R N Barlow and Associates Limited

April 2010 – Present (3 years 5 months)

Advisory services in transport, marine and engineering sectors
Governance positions in engineering, logistics, infection control and bio security solutions

Director Engineering Taranaki Consortium

June 2010 – July 2012 (2 years 2 months) New Plymouth NZ

Independent Director

Operations Manager at Port Taranaki Limited
September 1988 - April 2010 (21 years 8 months)
Deputy Chief Executive, responsible for all operations, engineering and procurement.
Marine
Services – pilotage, towage, launches, moorings, hydrography.
Engineering Design and Maintenance. Container Terminal Operations, Petro-chemical terminal operations, Security. Statutory compliance.
Harbourmaster Port Taranaki at Taranaki Regional Council
September 1988 - December 2009 (21 years 4 months)
Responsible for management of safety of navigation at Port Taranaki. Development and implementation of Marine Oil Spill response plan
Relief Pilot and Loading Master at NZ Steel Mining Ltd
January 1980 - December 1995 (16 years)
Acting as relief pilot and loading master at the Taharoa Marine Terminal for the export of ironsands in slurry form into bulk carriers up to 135,000 dwt through an SBM moored in the Tasman Sea
Harbour Pilot at Taranaki Harbours Board
October 1970 - August 1988 (17 years 11 months)
Harbour Pilot, Tugmaster, Dredgemaster

Recent Projects

Review of New Zealand's Oil Spill Preparedness and Response Capability

Work as part of a team with Thompson Clarke Shipping Limited to review and report on NZ's oil spill preparedness and...View

Review operating parameters for pilotage of vessels entering and departing the Port of Gisborne

Full review of berthing criteria applying qualitative risk assessment techniques and recommendations on weather parameters

Value for Money Review Maritime New Zealand

Part of a team of industry players assisting MNZ to evaluate its performance and identify where value for money could be better spent

Review of New Zealand's Oil Spill Preparedness and Response CapabilityEditRe-order section

November 2010 – February 2011

Work as part of a team with Thompson Clarke Shipping Limited to review and report on NZ's oil spill preparedness and response capability

Safety Management system for Port Otago and Otago Regional Council

Assist development of a Safety Management system in compliance with the NZ Port and Harbour Safety CodeView

Marine advice to ALARP review of Wire lining at Kupe Offshore Platform Origin Energy

Acted as marine advisor to Operational safety review of proposed well maintenance procedures on Kupe Offshore platform

Marine advisor project to extend pipelines and relocate SBM at Taharoa Offshore Loading Terminal NZ

1. Marine advice for launching 450m triple pipeline at Port Taranaki NZ 2. Marine advice for 70nm bottom tow to Site

Report on Future Towage requirements for the Port of Gisborne

Review existing towage arrangements and forecast shipping arrivals. Report on requirements to meet current and future

Marine Advisor to Trans Tasman Resources Ltd Marine Advisor for Consenting

Provide advice on the effects of proposed marine operations in preparation of evidence for resource consent applications for mining ironsands

Project to improve Mooring Safety at Port Taranaki

Development of Port Numerical Wave Model to describe current wave climate under storm conditions and test various mooring

Project to advise on depth required for future operations at Eastland Port NZ

Project to assess depth required for future operations at Eastland Port to assist in Resource Consent application for dredging

Memberships

Member of the Institute of Directors

Member of the Nautical Institute

Past President of the New Zealand Maritime Pilots Association