# Appendix 5

## Draft Management Plans

Enviser Ref:1116
October 2022

# DRAFT CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

## PROPOSED RECLAMATION AND WHARF

Northport Ltd

# Contents

# 1 Introduction

***This document is a draft version, prepared in support of resource consent applications. This document must be updated and refined following resource consent approval to incorporate specific resource consent conditions. This document must also be updated once the detailed design and construction methodology is determined.***

This construction environmental management plan (CEMP) has been collated by Enviser Limited with technical input and content provided by the following consultants:

- Pattle Delamore Partners
- Marshall Day Acoustics
- Cawthron Institute
- Styles Group
- Coast and Catchment
- Tonkin + Taylor
- MetOcean Solutions
- Boffa Miskell
- Clough & Associates

## 1.1 Purpose

This purpose of this CEMP is to document the practices required to minimise environmental effects and ensure compliance with performance standards during the proposed eastern extension of Northport. This document has been prepared for the construction phase of the project and relates to the primary activities of reclamation and wharf construction.

## 1.2 Statutory requirements

Upon consents being granted, **Table 1-1** will identify the relevant consent conditions and where these are addressed in the CEMP.

**Table 1-1: Relevant consent conditions to CEMP**

| Consent or Authority | Details | Section in CEMP |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## 1.3 Updating the CEMP

This CEMP is a live and controlled document that will be continuously reviewed and updated throughout the duration of the project. Upon appointment, the selected Contractor will update this management plan to ensure that it aligns with the final construction methodology and appropriately addresses all construction related impacts associated with this project.

The Contractor is responsible for updating the CEMP in conjunction with Northport Ltd as required. **Table 1-2** below presents a document control register to track the changes made to the document.

**Table 1-2: Document control register**

| Date | Page/s Amended | Nature of Change | Approved By |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# 2 Roles and responsibilities

It is the responsibility of Northport to ensure that the Contractor understands and can implement the requirements of this CEMP. The Contractor is responsible for training their staff and ensuring that they understand and are able to implement the requirements of the CEMP. **Table 2-1** details the person responsible for potential construction environmental effects and their contact details for this project.

**Table 2-1: Roles and responsibilities register**

| Role | Responsibility | Contact |
|---|---|---|
| Project Manager | | |
| Contractor - lead | | |
| Foreman | | |
| Subcontractor | | |
| Northport Contact Person | | |
| **Technical Experts** | | |
| Air quality | | |
| Hazardous substances specialists | | |
| Erosion and sediment control expert | | |
| Wildlife expert | | |
| Marine works expert | | |
| Archaeologist | | |
| Noise expert | | |
| Marine biosecurity expert | | |

# 3 Site description

Northport is a deep-water commercial port located at Marsden Point in Northland. The port is located at the entrance to the Whāngarei Harbour, between the Marsden Point Channel Infrastructure facility to the east, and One Tree Point to the west (**Figure 1**).


**Figure 1: Northport location (source: Google Earth)**

Northport occupies approximately 48.5 ha of land, with most of this area now being used for cargo operations (**Figure 2**). Of the existing port operations, approximately 33.6 ha is reclaimed land.


**Figure 2: Northport site operations (source: ME Consulting, 2021)**

Note the area outlined in green is already consented allowing reclamation of 4.3 ha to form Berth 4 and 270 m of wharf construction.

**The construction effects of reclamation and construction in this already consented area have been previously addressed and are not included in this CEMP.**

# 4 Project description

Northport Ltd owns and operates a multi-purpose cargo port at Marsden Point, known as Northport. Northport is seeking approvals to expand its existing facilities towards the east to increase its freight storage and handling capacity.

The expansion project is shown in **Figure 3** and involves:

- Reclamation within the Coastal Marine Area (CMA) and earthworks to the immediate east of Northport's existing facility. This will expand the footprint by approximately 13.7 hectares. This comprises 11.7 ha of reclamation within the CMA and 2 ha of earthworks outside the CMA
- Capital and associated maintenance dredging to enlarge and deepen the existing swing basin and to enable construction of the new wharf
- Construction of a 520 m long wharf (including the consented but not yet constructed 270m long Berth 4) on the northern (seaward) face of the proposed reclamation
- Sheet piling and rock revetment structures on the eastern edge of the proposed reclamation
- Treatment of operational stormwater via the existing pond-based stormwater system
- Construction of a new tug jetty
- Replacement of the existing floating pontoon, public access and public facilities
- Port related activities on the proposed expansion and wharves including a container terminal, Coastguard, biosecurity, border control/customs and quarantine facilities, harbour control facilities plus supporting offices and workshops

This CEMP addresses construction effects associated with all of the project aspects described above **excluding** the capital and associated maintenance dredging. These aspects will be addressed in two documents:

- Dredging Environmental Management Plan (DEMP), and
- Environmental Monitoring and Management Plan (EMMP)

These will control the operations of the dredging equipment and the water quality issues during the dredging operations. A draft EMMP has been prepared to accompany the consent application. The DMP requires knowledge of the specific dredge equipment, therefore will be prepared once the dredge contractor has been appointed.

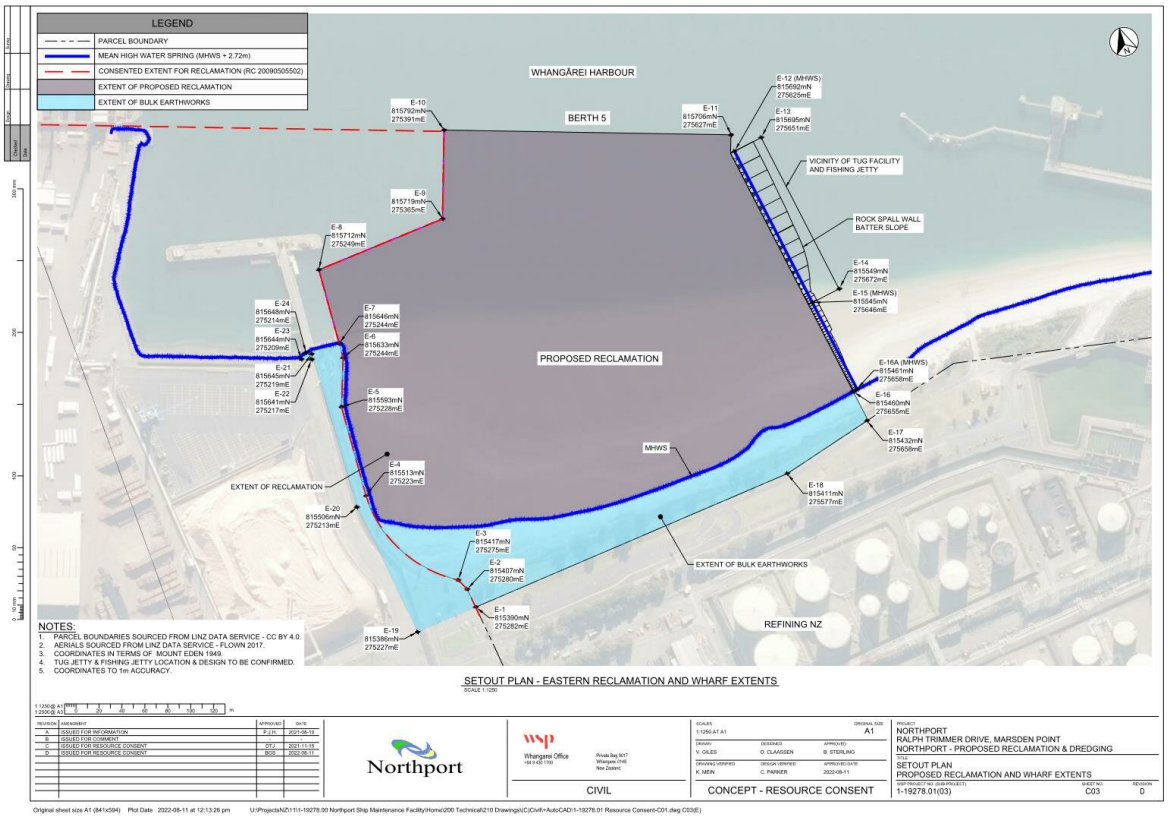



**Figure 3: Reclamation footprint shown in grey, blue shows earthworks above MHWS (source: WSP, 2022)**

# 5 Environmental risk assessment

Before any risks can be managed or controlled it is necessary to know the nature, likelihood, and impact of those risks. Risk management involves the identification, assessment, control, monitoring, and reporting of risks for the project. The risk assessment tools used in this assessment are shown in **Appendix A**. **Table 5-1** below identifies the key risks and associated risk rating for the project, separated into the two key activities, reclamation construction and wharf construction.

The term 'wharf construction' includes the construction of ancillary structures including construction of the tug jetty and replacement of the floating pontoon. As the project progresses and the risks and reassessed, it may be appropriate to separate out the construction of the ancillary structures from the wharf construction and assess the risk separately.

The risk rating for each environmental effect was generated using the risk assessment tool described in Appendix A. Each environmental effect was assessed based on the likelihood of occurrence and the potential impact. Where technical assessment reports were available e.g. noise, marine mammals and dust, the risk classification provided in the technical reports was used.

The risks were assessed across the two primary stages of development, the reclamation construction and the wharf and ancillary structure construction.

In each section, the highest risk identified was selected as the overarching risk classification for that activity.

**Table 5-1: Project specific environmental risks**

| **Environmental effect** | **Risk Rating: Reclamation Construction** | **Risk Rating: Wharf Construction and Ancillary Structures** |
|---|---|---|
| Dust | LOW | LOW |
| Hazardous substances | HIGH | HIGH |
| Erosion and sediment generation (land) | LOW | LOW |
| Wildlife | LOW | MEDIUM |
| Marine works | HIGH | MEDIUM |
| Archaeology | LOW | LOW |
| Noise and vibration | LOW | HIGH |
| Marine biosecurity | TBC | TBC |

The specific environmental risks are discussed in more detail in the following sections. Technical reports in support of the environmental risk assessment are included in a separate Technical Report document package which accompanies this CEMP.

# 6 Dust

## 6.1 Environmental risk assessment

There will be several dust generating activities associated with the reclamation construction and wharf construction. Pattle Delamore Partners have prepared a draft Dust Management Plan[1], detailing the sources of dust and proposed monitoring and management during the construction phase.

The environmental risk assessment of dust at the site is judged as **LOW**. The risks are described in further detail in **Tables 6-1 and 6-2**.

**Table 6-1: Environmental risk assessment for DUST (reclamation construction)**

| Work Stage | Risk Rating |
|---|---|
| Dredge spoil infill and dewatering/decanting | LOW |
| End tipping into sea to form bund for reclamation | LOW |
| On land earthworks and bulk filling | LOW |
| On-site stockpiling and processing of material | LOW |
| Reclamation surface | LOW |
| Trimming & shaping seawall and revetment | LOW |
| Truck and other machinery movements | LOW |

**Table 6-2: Environmental risk assessment for DUST (wharf/ancillary construction)**

| Work Stage | Risk Rating |
|---|---|
| Decking and other infrastructure construction | LOW |
| General earthworks and bulk fill | LOW |
| Revetment (move, repair, replace) | LOW |
| Truck and other equipment movements | LOW |
| Wharf piling | LOW |

## 6.2 Performance standards

The performance standards for dust management come from:

- The Resource Management Act 1991
- National environmental standards for air quality (NESAQ, 2014)
- Regional and district plans
- Resource consents

There is little risk of dust migrating from the construction activities to residential receptors based on the geographic separation of Northport operations from surrounding residential areas (i.e. One Tree Point. Therefore, the receiving environment has been identified primarily as port operations, beach users, users of the Ralph Road carpark and commercial activities located south of Northport (PDP, 2022).

[1] Pattle Delamore Partners, Northport – Draft Dust Management Plan, July 2022 – included in the Technical Report folder

## 6.3 Control measures

Due to the nature of the construction activities, measures are required to manage the risk of dust generation throughout the construction of the reclamation and wharf construction. This is typically managed by limiting exposed surfaces and managing dusty operations, particularly during windy conditions.

**Tables 6-3** and **6-4** set out the dust risk and main matters of control for each of the activities associated with the reclamation and wharf construction work. As many of the control measures rely on dampening down surfaces, the Contractor shall have a water cart (or other suitable means of applying dust suppressant) available at all times. Further matters of control are given as part of the Inspection Checklists in **Appendix B**.

**Table 6-3: Control methods for DUST (reclamation construction)**

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| Dredge spoil infill and dewatering/decanting | LOW | N/A – in water |
| End tipping into sea to form bund for reclamation | LOW | • Limit loading in windy conditions<br>• Keep the material damp<br>• Keep drop heights of dry material to a minimum (<3m) |
| On land earthworks and bulk filling | LOW | • Limit loading in windy conditions<br>• Minimise drop heights to control the fall of materials |
| On-site stockpiling and processing of material | LOW | • Locate stockpiles as far away as practicable from identified sensitive receptors<br>• Orientate stockpiles to maximise wind sheltering as much as possible<br>• Maintain the height of stockpiles to <5m, but ideally <3m<br>• Limit the drop height to <3m<br>• |
| Reclamation surface | LOW | Wet areas as needed. Not expected to be dusty operation as material will be wet |
| Trimming & shaping seawall and revetment | LOW | Wet areas as needed. Not expected to be dusty operation as material will be wet |
| Truck and other machinery movements | LOW | • Minimise speed and travel distances of construction traffic around the site<br>• Stabilise internal roads and use stabilised construction entrances<br>• Keep unsealed roads damp in windy conditions |

**Table 6-4: Control methods for DUST (wharf/ancillary construction)**

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| Decking and other infrastructure construction | LOW | Apply water if needed during cutting/breaking to dampen surface |
| General earthworks and bulk fill | LOW | Maintain surfaces of active earthworks in a damp condition |
| Revetment (move, repair, replace) | LOW | Maintain surface moisture content on the revetment to limit potential for dust generation |
| Truck and other equipment movements | LOW | • Minimise speed and travel distances of construction traffic around the site<br>• Keep unsealed roads damp in windy conditions |
| Wharf piling | LOW | N/A – in water |

## 6.4 Monitoring and reporting

Dust monitoring and reporting measures will allow the Contractor to mitigate the low risk of dust from the proposed activities on people, both on and off site. Monitoring measures and reporting are set out in the following sections. Note that due to the low risk, specific quantitative dust monitoring is not proposed unless a large number of dust complaints are received.

### 6.4.1 Monitoring

Monitoring will include:

- Check and log weather forecast daily including assessment of wind speed and rainfall in order to adjust dust mitigation methods as required
- Carry out a daily visual inspection of site activities, dust controls, vehicle movements and site conditions and record in a daily dust log (provided in **Appendix B**)
- Carry out a weekly inspection of watering systems to ensure equipment is maintained and functioning effectively
- Keep an accurate log of all dust complaints from the public. If a large number of complaints are received, Northport could consider installing a dust monitor to monitor emissions at an appropriate location. A complaint form is included in **Appendix C**

### 6.4.2 Meteorological forecasts

Meteorological forecasts should be sourced from the contractor's preferred platform. Realtime weather data will be available for the site from Northport's meteorological monitoring stations. The Contractor will be responsible for checking forecasts and site data for strong winds (>5 m/s) and rainfall to plan appropriate activities and dust management responses.

The Contractor must communicate the likely weather conditions to site staff at the daily morning briefing, in particular predicted rainfall and wind conditions for the day.

### 6.4.3 Dust monitoring

- Visual inspections shall be undertaken at least once daily, depending on conditions, and logged using the Daily Dust Log form included in **Appendix B**.

- Daily inspections should include all exposed surfaces, active and inactive stockpiles, construction areas, adjoining roads, construction exits and land adjacent to the site
- The Contractor shall inspect the site more often if conditions change (i.e. increased wind speeds or during prolonged spells of dry weather) and as new activities are commenced (i.e. new stockpiles are made)

- The following wind trigger values have been set up to inform Northport when high winds are occurring and the appropriate response:
  - Trigger 1: Winds from the west to the northwest and greater than 4 m/s at ground level require Northport staff to review the on-site activities and mitigation measures in place
  - Trigger 2: Winds from the west to the northwest and greater than 5 m/s at ground level in dry conditions require all dust generating activities within 400 m of a sensitive receptor to cease until winds drop below 5 m/s based on a 10-minute average, if dust is observed to be travelling offsite

### 6.4.4 Reporting

The Contractor must maintain a record of completed dust management inspection logs as well as any incident or complaint investigations (noting that complaints may come to Northport directly).

These records shall be completed and provided to the Northport Project Manager at least once a week. If Northport receives a dust complaint, the Northport Project Manager shall inform the Contractor of the details of the complaint as soon as practical.

In the event of a dust complaint, the following should be noted:

- Time, date and location of the complaint (if known)
- Description of the dust complaint (to the extent known)
- Wind direction and strength and weather conditions at the time
- As soon as possible (within 1 hour, where practicable), visit the area from where the complaint originated to ascertain if dust is still a problem
- Details of the site inspection following the complaint and dust management and control measures being undertaken at the time of the complaint as well as any changes made to these as a result of the complaint
- Contact the complainant to explain any problems found and remedial actions taken

## 6.5 Contingency

The following contingency measures are to be implemented in the event the primary mitigation measures fail, or are unsuccessful in managing dust in certain circumstances. Note, these measures will only be implemented if normal control measures are not successful in managing dust (**Tables 6-5**):

**Table 6-5: Contingency measures for dust management**

| Additional risks | Actions to consider |
|---|---|
| Breakdown or failure of water suppression systems | • Cease activities that may cause dust<br>• Restore water system where possible<br>• Source an additional supply if the original system cannot be restored |

| Additional risks | Actions to consider |
|---|---|
| Dust impacts occurring after hours | A 24-hour contact is to be made available to respond to complaints and implement response measures as necessary |
| Large number of dust complaints (>10) | Consider installing a dust monitor to alarm when dust concentrations exceed the desired level |
| No water available for dust suppression during prolonged dry periods | • All dust generating activities will be ceased until an alternative supply can be obtained<br>• Consider seawater as an alternative supply |
| Excessive[2] vehicle emissions | Ensure vehicles moving on site have undergone regular maintenance so that vehicle emissions are kept to a minimum |



[2] Any emissions that exceed the limits outlined in the Land Transport Rule: Vehicle Exhaust Emissions Amendment Act 2009, Rule 33001/2.

# 7 Hazardous substances

Hazardous substances are likely to be stored and used on-site throughout the construction activities. The Contractor must document the hazardous substances that may be stored, used or transported onsite during the construction period and outline the specific controls around their transport, storage and use to minimise the risk of having the substance on-site – this will be detailed in this section (Section 7) before finalisation of this CEMP.

The hazardous materials used in the process are fuels, lubricant oils, hydraulic oils, paints and solvents. Note that any use of hazardous substances means the risk is judged as **HIGH (Tables 7-1 and 7-2)**.

## 7.1 Environmental risk assessment

The hazardous substances that may be used on-site (TBC) could include.

- Fuels
- Lubricant oils
- Hydraulic oils
- Paints and solvents

**Table 7-1: Environmental risk assessment for HAZARDOUS SUBSTANCES (reclamation construction)**

| Work Stage | Risk Rating |
|---|---|
| Dredge spoil infill and dewatering/decanting | HIGH |
| End tipping into sea to form bund for reclamation | HIGH |
| On land earthworks and bulk filling | HIGH |
| On-site stockpiling and processing of material | HIGH |
| Reclamation surface | HIGH |
| Trimming & shaping seawall and revetment | HIGH |
| Truck and other machinery movements | HIGH |

**Table 7-2: Environmental risk assessment for HAZARDOUS SUBSTANCES (wharf/ancillary construction)**

| Work Stage | Risk Rating |
|---|---|
| Decking and other infrastructure construction | HIGH |
| General earthworks and bulk fill | LOW |
| Revetment (move, repair, replace) | LOW |
| Truck and other equipment movements | LOW |
| Wharf piling | LOW |

## 7.2 Performance standards

The performance standards are dependent on the type of substance/material, but all storage and use of hazardous substances must comply with the relevant regulations and the performance standards in those regulations. This includes the HASNO Act, resource consents and health and safety regulations. The details of this sections shall be filled out by the Contractor once it is known

the type and volume of hazardous substances to be used and stored on site. This must be completed before construction commences.

## 7.3 Control measures

The controls relate to the type of substance used as substances may be used across several stages of work activities.

### 7.3.1 Before arriving at site

- Establish of a hazard substance store and receipt of all permits and documentation needed for that storage
- Locate at least 1 fire extinguisher at each hazard substance store
- Source spill response equipment
- Provide of a cage for any storage of gas cylinders
- Prepare an Emergency Response Plan which includes a Spill Response Plan
- Designate refuelling areas for mobile plant. This area must be bunded and either be surfaced with an impermeable material (i.e. asphalt/concrete) or have a liner overlain by soil which can be removed and disposed of at the end of works
- Engage a dedicated Approved Handler who is responsible for the Hazardous Substances stores and ensuring compliance with the CEMP and HSNO
- Develop a process to review new hazardous substances brought to site which are not included in the list of specific substances mentioned in **Table 7-3**
- Develop a process to monitor compliance with the requirements of the CEMP

### 7.3.2 During site works

- Store of all hazardous substances in the appropriate storage facility
- Provide copies of safety data sheets at all Hazardous Substance stores and include a site map (**Appendix D**)
- Ensure hazardous atmosphere zones and location test certificates are identified and met, and copies of all location test certificates held on-site
- Install appropriate signage
- Ensure all practicable measures are undertaken to prevent oil and fuel leaks from vehicles and machinery
- Ensure all machinery undergo pre-start checks, particularly of hydraulic hose elements and connections
- Ensure all vehicles and work areas have a spill kit appropriate to hazardous substances and volume being used (including for any hoses or equipment that could leak)
- Ensure all refuelling of equipment on land or over water is supervised throughout the whole activity and spill containment equipment is immediately available
- Ensure all refuelling equipment has cut-off valves and the delivery side is attended at all times
- Ensure spill containment equipment is available as all activity is on or near water

### 7.3.3 Regulatory requirements (regional and district plan)

- Fuel must not be stored and machinery must not be refuelled in any location where fuel may enter water, including:
    - o On, over, or in the bed of a surface waterbody or the coastal marine area
    - o Within 10 metres of a surface waterbody or coastal water

- There shall be no storage of fuel within 30 metres of a General Coastal Zone

### 7.3.4 Specific controls relating to portable refuelling containers

- No container to be located within 20 m of a water body
- The aggregate quantity of specified hazardous substances stored on a site in a portable container shall not exceed 2000 litres
- A container shall be located in an area or structure that will contain a leak or spill of the substance and will allow the spilled substance to be collected
- Equipment that is suitable to absorb any leak or spill of the substance shall be located with the container at all times along with instructions on how to use the spill kit
- A portable container shall not remain on a site for a continuous period of more than 90 days

**Table 7-3: Hazardous substance specific controls (TBC)**

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| Cements, concrete admixtures, fillers, grouts, mortars, plasters, putties, roading products, concrete etching agents | | |
| Fuel | | |
| Lubricant oils | | |
| Hydraulic oils | | |
| Paints and solvents | | |

### 7.3.5 Waste management

All hazardous substances no longer required during the construction phase shall be:

- Removed and stored at another suitable storage facility for hazardous substances; or
- Removed by a licensed operator and treated so that it is no longer a hazardous substance
- Packaging that contained a hazardous substance shall be disposed of in an appropriate manner, taking into account the nature and type of packaging. If any residue of the hazardous substance has to be removed, or treated so it is non-hazardous, the package may be reused or recycled.

## 7.4 Monitoring and reporting

- The Contractor shall maintain a Hazardous Substances Inventory and ensure it is kept up to date and made available on request to Northport, Northland Regional Council and Worksafe staff
- Copies of safety data sheets shall be established around all Hazardous Substance stores and shall be included on a site map and should be clearly marked on-site

## 7.5 Contingency

A Spill Response Plan (as described in Section 7.1.1) shall be prepared by the Contractor and put in place for the duration of construction. This can be appended to the CEMP when prepared.

# 8 Erosion and sediment control

This section (Section 8) discusses the erosion and sediment risks and controls associated with land-based construction works only. Works completed within the marine environment e.g., wharf construction, are discussed in detail in Section 10.

## 8.1 Environmental risk assessment

Erosion and sediment control measures during construction of the reclamation and wharf construction is required for:

- Stormwater runoff and discharge
- Erosion of the leading face of the reclamation and/or bund due to wave action

### 8.1.1 Stormwater runoff and discharge

During rainfall events, runoff from unstablised ground can entrain sediment (silts and clays) that, when discharged to the marine environment, can have adverse effects. Contaminants can also be adsorbed to the sediments, resulting in further potential effects.

### 8.1.2 Erosion of the leading face of the reclamation and/or bund due to waves

Rough sea and swell conditions can cause large, localised erosion events of reclamation edge through waves and current action, including wave run-up onto the reclamation. There is a particularly high risk when the reclamation material is exposed prior to placement of rip-rap protection.

Wave induced erosion of the reclamation face can generate sediment plumes as fine material is eroded by wave action and transported by currents. The occurrence, concentration and extent of sediment plumes is dependent on a number of factors, with the most important being the content of the fill, the presence of erosion protection and the wave energy.

In addition, during high energy events, waves may run up onto the reclamation and erode the top surface of the reclamation as the water recedes.

Given the nature of the fill material (sands) and wave environment, there is a potential for wave induced erosion and plumes to occur. However, given infrequent large wave events at Northport, the frequency and duration of reclamation erosion events and plumes is not expected to be significant. For the purposes of this project the risks are considered high and mitigation measures are required.

**Table 8-1** below indicates the potential risk of erosion and sediment for each of the types of work associated with land-based activities. Risk is dependent on the scale of the and type of activity. Control measures are suggested for each activity type and are discussed in Section 8.3. The environmental risk assessment of erosion and sediment during land-based activities is judged as **HIGH**. The risks are described in further detail in **Table 8-1**.

**Table 8-1: Environmental risk assessment for EROSION & SEDIMENT CONTROL (land-based activities)**

| Work Stage | Risk Rating |
|---|---|
| On land earthworks and bulk filling | HIGH |
| On-site stockpiling and processing of material | MEDIUM |
| Trimming & shaping seawall and revetment | HIGH |

| Work Stage | Risk Rating |
|---|---|
| Truck and other machinery movements | MEDIUM |

## 8.2 Performance standards

The water quality requirement for discharges from Northport to the Harbour is set out in the Regional Coastal Plan. These closely replicate section 107 of the RMA.

The exact performance standards will be set either in resource consent conditions or from the permitted activity standard (13.3.13 General Performance Standards)[3] .

In general, the performance standards require:

Discharges to water shall, after reasonable mixing, comply with the relevant receiving water quality standards and shall not contain any contaminants which could cause:

(i) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials
(ii) any conspicuous change in the colour or visual clarity of the receiving waters
(iii) any emission of objectionable odour
(iv) accumulation of debris on the foreshore or seabed underlying or adjacent to the discharge point
(v) any significant adverse effects on aquatic life or public health

These performance standards are relevant at the point of discharge.

## 8.3 Control measures

Avoidance, treatment and control measures are all ways sediment and erosion risk can be managed. A summary of controls is shown in **Table 8-2**.

**Table 8-2: Control methods for EROSION & SEDIMENTATION (land-based activities)**

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| On land earthworks and bulk filling | HIGH | Described in Section 8.3.1 |
| On-site stockpiling and processing of material | MEDIUM | • Divert surface water runoff away from stockpiles<br>• Cover, compact or roll for rainfall or high wind events<br>• Keep 50 m away from the water's edge where practical<br>• Surround with silt fences or bunding if required |
| Trimming & shaping seawall and revetment | HIGH | • Monitor weather forecasts to be informed of upcoming wind/wave events so protections can be put in place before weather event occurs<br>• Complete the work in sections and place erosion protection a quickly as possible on the completed section<br>• Minimise the open work front to reduce the risk of erosion |

[3] Northland Regional Council, Regional Coastal Plan for Northland

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| | | • Laden excavator buckets should only be swung above water to reduce sediment plumes. Underwater bucket movements should be limited to vertical movements only |
| Truck and other machinery movements | MEDIUM | • Stabilised road<br>• Entry/exit point designed to prevent sediment tracking offsite<br>• Wheel wash if required<br>• Grade/crossfall roadways to shed water an prevent pugging and saturated roadways<br>• Perimeter controls to prevent water running onto the roadway<br>• Sediment control devices (i.e. silt fences) where needed |

### 8.3.1 Sediment controls

The following outlines the different types of controls that can be implemented as avoidance, minimisation or treatment measures. These controls have not been included in **Table 8-2** as they are best described in text rather than tabular form.

**Perimeter diversion measures**

Interception of 'clean' water upgradient of the site is important for:

- Reducing the stormwater runoff volume
- Reducing the potential for contaminants offsite to enter the construction area

Catch/diversions drains shall be installed on the upgradient perimeter of the site, these should discharge to the operational stormwater treatment system.

Diversion channels may be required to be stabilised with geotextile if they exhibit signs of erosion.

**Site grading**

The site should be graded to ensure runoff is directed to collection channels/drains and away from stockpiles, roads and the active work areas. The channels/drains within the site should be spaced to minimise runoff becoming concentrated and causing erosion. The channels/drains are also useful to separate the large catchment area of the site into smaller manageable catchments.

**Stabilisation of roads and site entrance**

Stabilisation of roads will be undertaken using a suitable granular material, followed by watering and compaction to minimise erosion potential and tracking offsite. Watering minimises dust risk.

Site entrance and exit points may require a more engineered solution to manage sediment tracking offsite, for example a cattle-stop style grated entrance or a wheel wash. A simple stabilised entrance comprising a larger, high porosity material (i.e. railway ballast) may be suitable for lower trafficked access points.

**Sediment fences or control devices**

Sediment fences and silt control devices are necessary to prevent sediment discharging from the site to the marine environment. These are only required adjacent to areas where there is a potential for sediment laden water to discharge from the site. Silt fences are expected to be needed along the seaward edge of the site, or on other boundaries where the site grades to external land.

Silt fences can be used across channels, but only in areas where there are areas of very low flow. In higher flow channels, check dams or other measures should be used to trap sediment.

Prior to discharge to the marine environment, all runoff requires some form of treatment. This can either be via the implementation of sediment control devices, such as decant basins, infiltration-based basins, permeable bunds and silt fences, or by directing runoff to existing stormwater treatment infrastructure. Discharging to the existing treatment infrastructure is not a preferred option.

### 8.3.2 Erosion and sediment control plans

The specific controls, their location and design will be established by the Contractor once details of the construction methodology are finalised. At this point the Contractor will prepare drawings showing the proposed location and design of the measures. This CEMP will be updated to suit and will include the maintenance measures specific to those controls.

### 8.3.3 Decommissioning of controls

Removal of erosion and sediment controls will only occur once the exposed surfaces are stabilised or permanent stormwater management measures are in place. Stabilised means the site is vegetated or has a surface layer of compacted granular material or an impermeable surface (such as concrete or asphalt).

## 8.4 Monitoring and reporting

Monitoring and reporting requirements depend on the types of works being undertaken – as shown in **Table 8-4** below.

### 8.4.1 Monitoring compliance with performance standards

In order to evaluate the effectiveness of the control measures, monitoring is required. Due to the highly dynamic environment, quantitative monitoring is not always possible, consequently the monitoring is a mixture of qualitative and quantities measures.

Suggested monitoring measures are:

- Daily visual inspection and photographs of the working face, during active work in the marine area, to ascertain the presence and extent of discernible plumes. A sediment plume inspection record is provided in **Appendix B**.
- Sampling of construction phase stormwater discharge at the point of discharge, at least twice per year, when discharge is occurring. Samples should be tested for Total Suspended Solids and compared against the performance standards

### 8.4.2 Maintenance and inspections

Maintenance, inspections and monitoring are required to ensure the control measures are in good working order and are performing as expected. The nature of the maintenance and the frequency of inspections/monitoring are dependent on both the type of control and the environmental conditions.

**Table 8-3** details the inspection and monitoring requirements for the different work phases.

**Table 8-3: Inspection and monitoring requirements**

| Work phase | Frequency | Monitoring actions |
|---|---|---|
| Revetment trimming or rip-rap repair | Daily | Visual inspections from an elevated position to assess sediment plumes and stability of seaward edges. Modify techniques if plumes are larger than anticipated. |
| General earthworks | Weekly | Visual inspection of sediment control devices and features, maintain as required.<br>Inspect all elements after a rainfall event >10mm, remove accumulated sediment where it may impact performance of features. Repair elements as needed. |
| After stabilisation and installation of final stormwater system | • Monthly<br>• After rainfall event greater than 20mm/24hr | Check all stormwater control features and ensure no uncontrolled discharges are occurring |

In addition, the following is required:

- Once a month the Northport Project Manager shall accompany the Contractor during the weekly site inspection to undertake an audit and ensure compliance with the CEMP and identify where/if any improvements are required
- A regular meeting will be held on site by the Contractor to discuss the results of the weekly inspection and monthly audit
- A stormwater inspection plan is to be created and implemented. This shall detail the specific maintenance and monitoring for the Contractor proposed control methods

### 8.4.3 Reporting

The Contractor will provide the Northport Project Manager with their completed inspection and monitoring checklists on a weekly basis.

## 8.5 Contingency

Where inspections identify areas of non-compliance or possible improvement the Contractor will be advised either verbally or in writing by either the Northport Project Manager or if applicable, via a Notice to Contractor prepared by the Project Engineer. Improvements to the control methods will then be implemented.

# 9 Marine works

For the purposes of this CEMP Marine works those works which are primarily undertaken in or over the marine environment. It does not include land-based works associated with the reclamation; these are discussed in Section 8.

Dredging operations are subject to separate controls set out in the Dredging Management Plan (DMP) and Environmental Monitoring and Management Plan (EMMP).

## 9.1 Environmental risk assessment

The primary environmental risk that this section seeks to control is discharge of contaminants (sediment and chemical contaminants).

Marine works can result in a disturbance of seabed sediments or the direct discharge of contaminants to the marine environment. The types of marine works needed for this project may include:

- Demolition/removal of wharves and existing revetments
- Reclamation construction using pumped marine sediments
- Decant of water from reclamation works
- Construction dredging (to shape reclamation edge) using a backhoe
- Placement of erosion protection (geotextiles, rip rap etc)
- Piling
- Wharf construction

Mitigation and control measures during construction of the reclamation land/bunds is required for:

- Sediment plumes from demolition, excavation/dredging and placement of erosion protection in the marine environment
- Sediment plumes from the reclamation and decanting of water (tidal inflow or dewatering from dredge spoil).
- Management of debris from demolition and construction works
- Management of concrete and concrete washwater during construction

### 9.1.1 Sediment plumes from demolition, excavation/dredging and placement of erosion protection

All of these activities have the potential to disturb the existing seabed sediments and cause sediment plumes which can migrate away from the site. These sediment plumes can impact on the marine environment. The scale and duration of sediment plumes will depend on the activity, the location of the activity, the nature of the sediments and tidal conditions. Due to the sensitivity of the surrounding marine environment and the likely scale of some activities, the potential effects is considered to be **high**. Control measures to mitigate these risks are required.

### 9.1.2 Reclamation construction using dredge spoil and associated dewatering/decanting

Dredge spoil (silty sands) will be used for the bulk reclamation fill. These materials will be pumped ashore as a slurry, approximately 30% solids and 70% water. The slurry will be pumped from the dredger, through a series of pipes and booster pumps, and ultimately discharged into the reclamation area where the solids will settle out. The resulting sandy silts will be distributed across the site using earthworks machinery.

The placement of dredge spoil must be done in a manner where the water (and entrained sediment) is contained and treated before discharge to the harbour. To achieve this, the dredge soil must be pumped into a contained area that is not open to the harbour. This may be achieved by bunds/cutoff walls, a sediment curtain or a combination of the two.

At the commencement of the operation, bunds may need to be constructed from imported material. As the reclamation progresses, these bunds may be created out of the dredge won sediments.

To ensure the discharge water quality is appropriate, a series of internal paddocks will be needed to settle out the finer-grained materials prior to discharge. The spoil would be pumped into the first pond, the sediment settles, and the water is decanted off the top into the next pond. This process is continued with a consequential reduction in the concentration of suspended solids in the decanted water at each step. Once the water reaches the desired quality it is discharged to the surrounding coastal water.

Overall, the risks posed by the reclamation and decant discharge activities are considered **high**.

### 9.1.3 Debris management

Construction and demolition activities have the potential to release debris into the marine environment as well as sediment plumes. Both can impact the marine environment. The risk posed by construction activities are judged to be **medium** due to the materials used and the nature of the work. Demolition works have a higher potential to release debris and are considered **high** risk. Management measures are needed for both activities.

### 9.1.4 Concrete and concrete washwater

Concrete and concrete washwater are strongly alkaline. Whilst seawater is an effective buffer, the discharge of concrete or concrete washwater can have adverse effects in the marine environment if discharged at high volumes or in areas where mixing is poor or aquatic ecosystem values are high. The site is subject to relatively high tidal flow volumes, which will generally provide adequate mixing, however the risk is still judged at **medium** as a large discharge could result in effects and control measures are needed.

**Tables 9-1** and **9-2** below indicate the potential risk of erosion and sedimentation for each of the types of work associated with the reclamation and wharf construction. Risk is dependent on the size of the project and type of activity. Control measures are suggested for each activity type are discussed in Section 9.3. The environmental risk assessment of erosion and sediment during reclamation construction is judged as **HIGH**. The risk assessment during wharf construction is judged as **MEDIUM**. The risks are described in further detail in **Tables 9-1 and 9-2**.

**Table 9-1: Environmental risk assessment for MARINE WORKS (reclamation construction)**

| Work Stage | Risk Rating |
|---|---|
| Construction dredging | HIGH |
| Decant discharge | HIGH |
| Placement of dewatered fill materials | HIGH |
| Pumping ashore of dredge spoil and dewatering of fill | HIGH |
| Removal and placement of erosion protection | MEDIUM |

**Table 9-2: Environmental risk assessment for MARINE WORKS (wharf/ancillary construction and demolition)**

| Work Stage | Risk Rating |
|---|---|
| Concrete work | MEDIUM |
| Demolition of revetments | MEDIUM |
| Demolitions of wharves and structures | HIGH |
| Wharf deck and other structures | MEDIUM |
| Wharf piling | LOW |

## 9.2 Performance standards

The overriding principles of the marine works are to:

- Minimise disturbance of sediment and generation of sediment plumes
- Contain sediment as far as practicable to the work area
- Prevent the loss of debris to the marine environment
- Avoid or minimise the loss of contaminants to the marine environment

The specific performance standards are yet to be confirmed but at minimum will be required for **decant discharge**. As described in Section 8.2, the water quality requirement for discharges from Northport to the Harbour is set out in the Regional Coastal Plan. These closely replicate section 107 of the RMA.

The exact performance standards will be set either in resource consent conditions or from the permitted activity standard (13.3.13 General Performance Standards) which require:

Discharges to water shall, after reasonable mixing, comply with the relevant receiving water quality standards and shall not contain any contaminants which could cause:

(i) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials
(ii) any conspicuous change in the colour or visual clarity of the receiving waters
(iii) any emission of objectionable odour
(iv) accumulation of debris on the foreshore or seabed underlying or adjacent to the discharge point
(v) any significant adverse effects on aquatic life or public health

These performance standards are relevant at the point of discharge.

## 9.3 Control measures

Avoidance, treatment and control measures are all ways marine works can be managed. A summary of controls is shown in **Tables 9-3 and 9.4**.

**Table 9-3: Control methods for MARINE WORKS (reclamation construction)**

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| Construction dredging | HIGH | • Monitor weather forecasts to be informed of upcoming wind/wave events so protections can be put in place before weather event occurs |

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| | | • Complete the work in sections and place erosion protection a quickly as possible on the completed section<br>• Minimise the open work front to reduce the risk of erosion<br>• Laden excavator buckets should only be swung above water to reduce sediment plumes. Underwater bucket movements should be limited to vertical movements only |
| Decant discharge | HIGH | • All decant discharges must be treated before discharge<br>• The treatment system must have sufficient capacity to treat the incoming volumes and achieve the performance standard. The system should have spare capacity built in to cater for unforeseen circumstances and storm events<br>• The bunds and paddocks shall be appropriately engineered to ensure they do not fail and release untreated water into the marine environment<br>• Dewatering pump from the top of the water level in the paddock, if possible, so cleaner water is pumped out<br>The decant discharge shall only be via the existing stormwater outlet beneath Berth 1/2 |
| Placement of dewatered fill materials | HIGH | • Placement must be within a controlled (bunded or silt fenced) area that is protected from currents and wave action<br>• Only place material that have sufficiently dewatered, so sediment plumes are minimised during placement<br>• Minimise the active working front |
| Pumping ashore of dredge spoil and dewatering of fill | HIGH | • Ensure all equipment is well maintained to prevent breakages and leaks<br>• Inspect connections (pipes/pumps etc) regularly (at least twice daily) to detect any leaks<br>• Ensure the onshore facilities have capacity for the pumping rates and volumes that the dredge will generate<br>• Ensure the discharge end of the pipeline is controlled to prevent movement and has the appropriate output velocity to prevent spillage |
| Removal and placement of erosion protection | MEDIUM | • Monitor weather forecasts to be informed of upcoming wind/wave events so protections can be put in place before weather event occurs<br>• Use a grab bucket (or clamshell) where possible to minimise the removal of underlying sediment |

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| | | • Complete the work in sections and place erosion protection a quickly as possible on the completed section<br>• Minimise the open work front to reduce the risk of erosion<br>• Laden excavator buckets should only be swung above water to reduce sediment plumes. Underwater bucket movements should be limited to vertical movements only |

**Table 9-4: Control methods for MARINE WORKS (wharf/ancillary construction and demolition)**

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| Concrete work | MEDIUM | • Controls must be in place to minimise the discharge of concrete wash water into the marine environment<br>• Minimise the use of flowable grout below MHWS<br>• Where boxing is placed below MHWS, ensure it is well sealed to reduce the loss of concrete/water into the marine environment<br>• Use methods that do not require large amounts of water application during curing<br>• Collect and dispose of concrete washwater and waste wet concrete appropriately |
| Demolition of revetment | MEDIUM | • Monitor weather forecasts to be informed of upcoming wind/wave events so protections can be put in place before weather event occurs<br>• Complete the work in sections and replace erosion protection a quickly as possible on the completed section<br>• Minimise the open work front to reduce the risk of erosion<br>• Laden excavator buckets should only be swung above water to reduce sediment plumes. Underwater bucket movements should be limited to vertical movements only<br>• Promptly remove excavated materials and place where runoff does not discharge to the marine environment<br>• Consider tides when working – low tide preferable for minimal risk of disturbance from wave action<br>• Sediment curtains around area if needed<br>• Place erosions protection on exposed areas as soon as practicable<br>• Use GPS assisted equipment to ensure accurate placement of rocks and reduce the amount of handling of rocks |

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| Demolition of wharves and other structures | HIGH | • Use debris booms to trap any construction material which may fall into the harbour<br>• To minimise the generation of debris, use deconstruction/demolition methods that avoid materials being broken apart in an uncontrolled manner<br>• Regular inspections and removal of debris from the structure and water during works |
| Wharf deck and other structures | MEDIUM | • Use debris booms to trap any construction material which may fall into the harbour<br>• Store construction materials away from the water's edge as far as practical, secure against wind<br>• Consider the use of nets below the working areas to capture debris |
| Wharf piling | LOW | • Monitor weather forecasts to be informed of upcoming wind/wave events so protections can be put in place before weather event occurs<br>• Ensure all equipment is well maintained to prevent breakages and leaks<br>• Inspect connections (pipes/pumps etc) regularly (at least twice daily) to detect any leaks<br>• Use debris booms to trap any construction material which may fall into the harbour<br>• Inspect connections between booms regularly (at least twice daily) to detect any breaches |

### 9.3.1 Controls

The following gives advice on the different types of controls that can be implemented as avoidance, minimisation or treatment measures.

**Settlement paddocks**

The sediment settling paddocks will require specific engineering design in order to achieve the performance standards. The design shall be based on the:

- expected pumping rate,
- volume of slurry per dredge discharge
- number of dredge discharges per day
- the particle size distribution of the sediment and anticipated settling velocities

**Sediment curtains**

Sediment curtains may be deployed in isolated instances for reclamation construction to manage unexpected sediment plumes. Wide scale use of a sediment curtains is not considered necessary given the likely extent of plumes from the proposed works, the natural variable turbidity regime and

the effectiveness of such a device. Sediment curtains were used successfully at Northport during Berth 3 construction.

The fill material is unlikely to have floatable components and there will be control over the nature of the material arriving. This means the Contractor can schedule the most appropriate material for the stage of construction. For example, the Contractor will use rock fill for the bund and exposed working faces, reserving the fill with finer grained material for enclosed areas or bulk filling above the water line.

### 9.3.2 Erosion and sediment control plans

The specific controls, their location and design will be established by the Contractor once details of the construction methodology are finalised. At this point the Contractor will prepare drawings showing the proposed location and design of the measures. This CEMP will be updated to suit and will include the maintenance measures specific to those controls.

### 9.3.3 Decommissioning of controls

Any marine based controls shall only cease once the works which require the controls cease.

## 9.4 Monitoring and reporting

Inspection and monitoring requirements depend on the types of works being undertaken – as shown in **Table 9-5** below.

### 9.4.1 Monitoring compliance with performance standards

In order to evaluate the effectiveness of the control measures, monitoring is required. Due to the highly dynamic environment, quantitative monitoring is not always possible, consequently the monitoring is a mixture of qualitative and quantities measures.

Suggested monitoring measures are:

- Daily visual inspection and photographs of the working face, during active work in the marine area, to ascertain the presence and extent of discernible plumes
- Sampling of decant discharge at the outlet, at least once per month, when discharge is occurring. Samples should be tested for Total Suspended Solids and compared against the performance standards
- Installation of a device, (electronic flow measurement, V-notch weir or similar) within the decant discharge system which allows flow to be measured during discharge. Flow measurements shall be recorded daily during discharge and compared against the performance standards. Average flow rates (over 7 successive readings) shall not exceed the performance standards

### 9.4.2 Maintenance and inspections

Maintenance, inspections, and monitoring are required to ensure the control measures are in good working order and are performing as expected. The nature of the maintenance and the frequency of inspections/monitoring are dependent on both the type of control and the environmental conditions.

**Table 9-5** details the inspection and monitoring requirements for the different work phases.

**Table 9-5: General Inspection and monitoring requirements**

| Work phase | Frequency | Monitoring actions |
|---|---|---|
| Reclamation surface is unstabilised and site is changing frequently | • Daily<br>• Before expected rainfall event<br>• After rainfall event greater than 20 mm/24hr | • Inspect all control measures (cut off drains, silt fences, soakage pits, dish drains), ensure all weather access to measures is maintained<br>• Walkover on reclamation to identify any channelised flow, erosion of surface and any non-controlled discharges off reclamation<br>• Once a week – fill in inspection sheet |
| Dewatering during dredge infill | Daily | Inspect the turbidity of the waters surrounding the activity |
| Reclamation surface is unstabilised but not changing | • Weekly<br>• Before expected rainfall event<br>• After rainfall event greater than 20 mm/24hr | • Inspect all control measures (cut off drains, silt fences, soakage pits, dish drains), ensure all weather access to measures is maintained<br>• Walkover on reclamation to identify any channelised flow, erosion of surface and any non-controlled discharges off reclamation |
| After stabilisation | • Monthly<br>• After rainfall event greater than 20mm/24hr | • Inspect whether surface remains stabilised |

In addition the following is required:

- Once a month the Northport Project Manager shall accompany the Contractor during the weekly site inspection to undertake an audit and ensure compliance with the CEMP and identify where/if any improvements are required
- A regular meeting will be held on site by the Contractor to discuss the results of the weekly inspection and monthly audit

### 9.4.3 Reporting

The Contractor will provide the Northport Project Manager with their completed inspection and monitoring checklists on a weekly basis.

## 9.5 Contingency

Where inspections identify areas of non-compliance or possible improvement the Contractor will be advised either verbally or in writing by either the Northport Project Manager or if applicable, via a Notice to Contractor prepared by the Project Engineer. Improvements to the control methods will then be implemented.

# 10 Wildlife

This section (Section 10) discusses the risk to wildlife from construction activities associated with the reclamation and wharf building works associated with the expansion project.

## 10.1 Environmental risk assessment

Wildlife control measures during construction of the reclamation land/bunds are required for:

- Avifauna
- Marine mammals

### 10.1.1 Avifauna

The risks to avifauna from construction activities come from:

- Permanent loss of foraging and roosting habitat
- Mortalities – particularly during nesting periods

An avifauna management plan (AMP) describing the management actions and monitoring that will be employed during the reclamation works to minimise effects on avifauna will be prepared and included in the accompanying Technical Report Folder.

### 10.1.2 Marine mammals

There is potential for the construction activities, particularly pile driving and dredging, to have effects on the marine mammal species that live or pass through the north-eastern coastal waters of the North Island. The species most likely to be present in the vicinity of the project area are bottlenose and common dolphins, orca and Bryde's whales. Other species of interest include New Zealand fur seals, leopard seals, and southern right and humpback whales which are seasonal visitors to the wider Bream Bay area.

The potential effects on marine mammals have been comprehensively assessed[4] and physical hearing injuries and/or habitat avoidance (due to the associated increase in underwater noise production from pile-driving and dredging activities) were identified as potential direct effects. Vessel strike and possible entanglement were identified as potential indirect effects of the reclamation works.

A marine mammal management plan (MMMP) describing the management actions and monitoring that will be employed during the reclamation works to minimise effects on marine mammal species has been prepared and is included in the accompanying Technical Report Folder.

The environmental risk assessment of wildlife during reclamation construction is judged as **LOW**. The risk assessment during wharf construction is judged as **MEDIUM**. The risks are described in further detail in **Tables 10-1 and 10-2**.

4 Cawthron - Potential construction effects on marine mammals in the Whangārei Harbour region – Eastern Reclamation 2021

**Table 10-1: Environmental risk assessment for WILDLIFE (reclamation construction)**

| Work Stage | Risk Rating |
|---|---|
| Dredge spoil infill and dewatering/decanting | LOW |
| End tipping into sea to form bund for reclamation | LOW |
| On land earthworks and bulk filling | LOW |
| On-site stockpiling and processing of material | LOW |
| Reclamation surface | LOW |
| Trimming & shaping seawall and revetment | LOW |
| Truck and other machinery movements | LOW |

**Table 10-2: Environmental risk assessment for WILDLIFE (wharf/ancillary construction)**

| Work Stage | Risk Rating |
|---|---|
| Decking and other infrastructure constructions | LOW |
| General earthworks and bulk fill | LOW |
| Revetment (move, repair, replace) | LOW |
| Truck and other equipment movements | LOW |
| Wharf piling | MEDIUM |

The following sections (10.2 – 10.6) relate to avifauna management only. All marine mammal related aspects of the project are described fully in the Marine Mammal Management Plan included in the Technical Report folder which accompanies this CEMP.

## 10.2 Performance standards

The management of effects on avifauna is subject to the provisions of the Resource Management Act 1991 and the Wildlife Act 1953. For this project, the prevention of harm to a

## 10.3 Control measures

Avoidance, treatment and control measures are all ways construction activities can be managed to protect avifauna and marine mammals.

The main activities associated with the potential to adversely affect avifauna is displacement of nesting habitat and foraging sources during construction activities. A summary of controls is discussed below in **Table 10-3**.

The controls relate to bird type (focusing on kororā and variable oystercatcher as the threatened or at-risk species that might be impacted by the proposal), rather than work type as the birds may be encountered across several stages of work activities.

**Table 10-3: Control methods for WILDLIFE**

| Bird Type | Control Measures |
|---|---|
| Kororā (penguin) | • Pre-construction (including rock removal) surveys by a suitably qualified and experienced coastal ornithologist to determine the presence of kororā within the western boundary riprap revetment |

| Bird Type | Control Measures |
|---|---|
| | • Establishment of exclusion zones around nesting and / or moulting birds[5]<br>• Rock removal works to be occur in the presence of a suitably qualified and experienced coastal ornithologist<br>• Measures to ensure that kororā are not trapped by construction works |
| Variable oystercatcher | • If construction works are to occur within 20 m of an area identified as potential variable oystercatcher nesting habitat during the breeding season, a suitably qualified and experienced coastal ornithologist should check for the presence of active nests<br>• If an active nest is detected, a 20 m exclusion zone should be established around the nest to ensure machinery and personnel do not come within 20 m of the nesting bird |

## 10.4 Monitoring

No specific monitoring is proposed at this stage, however this will need to be revisited once the construction methodology and programme is confirmed.

## 10.5 Reporting

The Contractor will provide the Northport Project Manager with their completed inspection & monitoring checklists on a weekly basis.

## 10.6 Contingency

Where inspections identify areas of non-compliance or possible improvement the Contractor will be advised either verbally or in writing by either the Northport Project Manager or if applicable, via a Notice to Contractor prepared by the Project Engineer. Improvements to the control methods will then be implemented.

[5] Under no circumstances should nesting birds, nest contents or moulting penguins be moved. Furthermore, a DOC Wildlife Act permit is required to handle species listed in the Wildlife Act (1954).

# 11 Archaeology

## 11.1 Environmental risk assessment

No archaeological sites are recorded within the footprint of the proposed port expansion, however there are twelve archaeological sites are recorded within 1km of the port facility. These are shown in **Figure 4**.

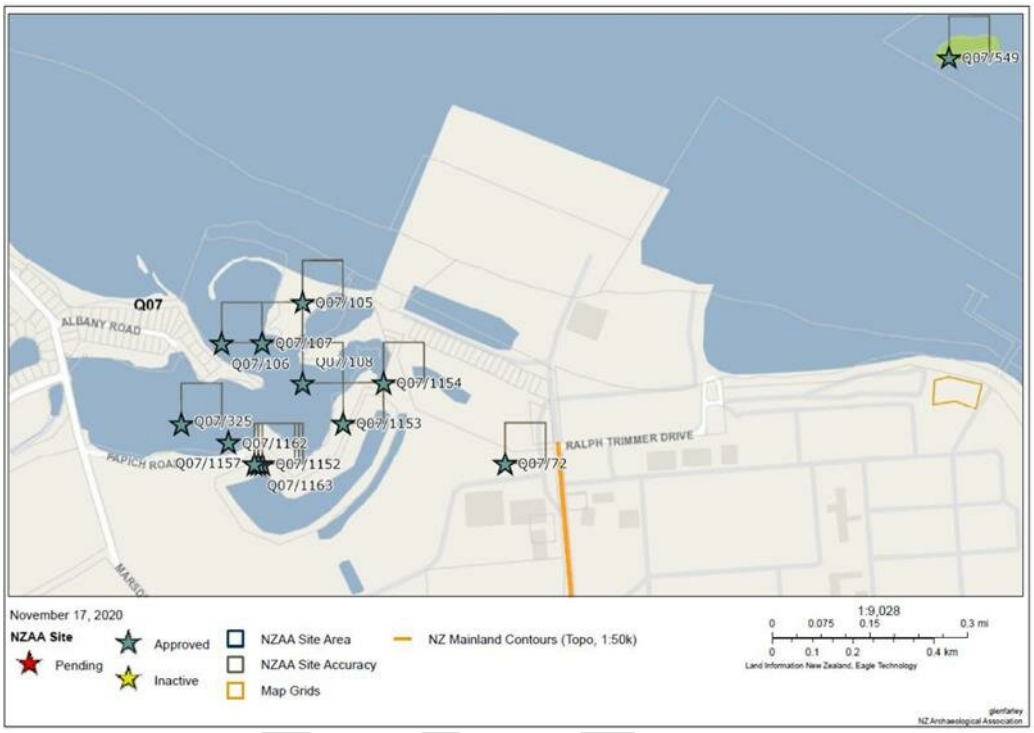



**Figure 4: Previously recorded archaeological sites in the vicinity of Northport. (source: Clough and Associates, 2022)**

There are no known marine archaeological artefacts in the reclamation project area. In addition, the nature of the activities means it is unlikely that there will be much disturbance of the seabed as the reclaimed material will cover the seabed as opposed to exposing potentially buried materials. The the potential risk for discoveries of historical significance is considered **LOW** as shown in **Tables 11-1 and 11-2**.

**Table 11-1: Environmental risk assessment for ARCHAEOLOGY (reclamation construction)**

| Work Stage | Risk Rating |
|---|---|
| Dredge spoil infill and dewatering/decanting | LOW |
| End tipping into sea to form bund for reclamation | LOW |
| On land earthworks and bulk filling | LOW |
| On-site stockpiling and processing of material | LOW |
| Reclamation surface | LOW |
| Trimming & shaping seawall and revetment | LOW |
| Truck and other machinery movements | LOW |

**Table 11-2: Environmental risk assessment for ARCHAEOLOGY (wharf/ancillary construction)**

| Work Stage | Risk Rating |
|---|---|
| Decking and other infrastructure constructions | LOW |
| General earthworks and bulk fill | LOW |
| Revetment (move, repair, replace) | LOW |
| Truck and other equipment movements | LOW |
| Wharf piling | LOW |

## 11.2 Performance standards

All work undertaken must comply with the authority requirements under the Heritage New Zealand Pouhere Taonga Act 2014. All construction works and equipment will be operated, maintained, supervised, monitored and controlled at all times so that the low risk of potential impact on archaeological sites is minimised.

## 11.3 Control measures

As this project has a low risk of disturbing archaeological remains, there are no additional controls, monitoring or reporting requirements, apart from the risk assessment detailed in this CEMP.

## 11.4 Monitoring and reporting

Monitoring will be undertaken through continuous observation and awareness by site construction team during works.

Reporting will be completed as per the Project Management Plan, Contract or Consent requirements.

## 11.5 Contingency

The Accidental Discovery Protocol (ADP) (**Appendix E**) applies across the Port in all areas of high and low risk activities. In the event of any discovery of a suspected archaeological site the actions included as part of this must be followed by the Contractor.

The accidental discovery protocol will be adhered to being:

- If subsurface archaeological evidence should be unearthed during construction (e.g. intact shell midden, hangi, storage pits relating to Maori occupation, or cobbled floors, brick or stone foundation, and rubbish pits relating to 19th century European occupation), work should cease in the immediate vicinity of the remains and Heritage NZ and the Council should be notified.
- If modification of an archaeological site does become necessary, an Authority must be applied for under Section 44(a) of the HNZPTA and granted prior to any further work being carried out that will affect the site. (Note that this is a legal requirement).
- In the event of koiwi tangata (human remains) being uncovered, work should cease immediately in the vicinity of the remains and the tangata whenua, Heritage NZ, NZ Police and Council should be contacted so that appropriate arrangements can be made.

# 12 Noise

There will be several noise generating activities associated with the reclamation construction and wharf construction proposed at Northport. Marshall Day Acoustics have prepared a draft Construction Noise Management Plan[6] (included in the Technical Report folder which accompanies this CEMP), detailing the sources of airborne noise and proposed monitoring and management during the construction phase.

Underwater noise mitigation and management measures are set out in the Marine Mammal Management Plan described in Section 10. Vibration is predicted to be imperceptible at the large setback distance from the works to receivers, so has not been addressed further in this section.

The closest receivers in both Reotahi and Marsden Bay are more than 800 m from the main works area, **Figure 5**. Construction will typically be carried out during daytime hours although some night works are expected (e.g. dredging and concrete pours). Loud activities such as piling will be limited to daytime hours and construction noise levels are predicted to comply with relevant limits. The predicted maximum noise levels for significant types of work are shown in **Table 12-1**.

The environmental risk assessment of noise at the site is judged as **LOW**. The risks are described in further detail in **Tables 12-2 and 12-3**.


**Figure 5: Map of works area and closest receivers (source: Marshall Day Acoustics, 2022)**

[6] Marhsall Day Acoustics, Northport Vision for Growth, Construction Noise Management Plan, July 2022

## 12.1 Environmental risk assessment

The predicted maximum noise levels for piling and reclamation construction is given in **Table 12-1**. The results of this, as well as the isolation of the reclamation activities means the risk for all types of work (as shown in **Tables 12-2** and **12-3**) is **LOW** except for piling which is always a **HIGH** risk activity.

**Table 12-1: Predicted maximum noise levels for significant types of work**

| Activity | Maximum sound power level (dB $L_{WA}$) |
|---|---|
| Piling | 116 |
| Reclamation activities (trucks/bulldozers/excavators) | 113 |

**Table 12-2: Environmental risk assessment for NOISE (reclamation construction)**

| Work Stage | Risk Rating |
|---|---|
| Dredge spoil infill and dewatering/decanting | LOW |
| End tipping into sea to form bund for reclamation | LOW |
| On land earthworks and bulk filling | LOW |
| On-site stockpiling and processing of material | LOW |
| Reclamation surface | LOW |
| Trimming & shaping seawall and revetment | LOW |
| Truck and other machinery movements | LOW |

**Table 12-3: Environmental risk assessment for NOISE (wharf/ancillary construction)**

| Work Stage | Risk Rating |
|---|---|
| Decking and other infrastructure constructions | LOW |
| General earthworks and bulk fill | LOW |
| Revetment (move, repair, replace) | LOW |
| Truck and other equipment movements | LOW |
| Wharf piling | HIGH |

## 12.2 Performance standards

**Table 12-4** sets out the construction noise limits which apply to the project. Note that these limits apply at the boundary of receptor property.

**Table 12-4: Guideline construction noise limits**

| Building type | Days | Times | Noise limit | |
|---|---|---|---|---|
| | | | $L_{Aeq(91)}$ | $L_{AF(max)}$ |
| Residential | Weekdays | 0630-0730 | 55 dB | 75 dB |
| | | 0730-1800 | 70 dB | 85 dB |
| | | 1800-2000 | 65 dB | 80 dB |
| | | 2000-0630 | 45 dB | 75 dB |
| | Saturdays | 0730-1800 | 70 dB | 85 dB |
| | | 1800-0630 | 45 dB | 75 dB |
| | Sundays and public holidays | 0730-1800 | 45 dB | 85 dB |
| | | 1800-0630 | 45 dB | 75 dB |

## 12.3 Control measures

All construction work except for piling meets the construction noise level limits, meaning the reclamation and wharf rebuild activities (except for piling) are able to be undertaken day or night, seven days a week provided that (as predicted by the noise assessment) the works meet the following noise limits:

- Daytime Mon – Sat 07:30 – 18:00 – 70 dB $L_{Aeq}$ and 85 dB $L_{Amax}$
- Daytime Sunday 07:30 – 18:00 – 45 dBA $L_{Aeq}$
- Night time Monday – Sunday 18:00 – 7:30 – 45 dBA

Piling works are not proposed to be undertaken night and consequently will be undertaken during daytime hours when works can be undertaken within the construction noise level limits. Consequently, piling works can occur:

- Daytime Mon – Sat 07:30 – 18:00 – 70 dB $L_{Aeq}$ and 85 dB $L_{Amax}$

If actual site measurements indicate different noise levels, the hours of work could be altered (either shortened or extended).

### 12.3.1 Administrative controls

#### 12.3.1.1 Training

All staff will participate in an induction training session before starting work on the construction, with attention given to the following matters:

- Activities with the potential to generate high levels noise
- Mitigation and management measures
- Sensitive receivers and any agreements made through engagement
- Monitoring requirements

As the construction progresses, any updates of noise matters will be addressed during regular site meetings and/or 'toolbox' training sessions.

#### 12.3.1.2 Equipment Selection

When selecting construction equipment:

- Use quieter construction methodologies where practicable (e.g. bored piling instead of drop hammer piling)
- Use electric motors rather than diesel engines where practicable
- Use rubber tracked equipment rather than steel tracked equipment where practicable
- Use equipment that is suitably sized for the task
- Maintain equipment well to minimise rattles, squeaks etc
- Fit engines with exhaust silencers and engine covers where practicable
- Avoid tonal reversing or warning alarms (beepers). Alternatives include broadband alarms (squawkers/quackers), flashing lights, proximity sensors, reversing cameras and spotters

### 12.3.2 Engineering controls

The following engineering measures (**Table 12-5**) will be put in place for the duration of the project:

**Table 12-5: Control methods for NOISE (reclamation and wharf/ancillary construction and demolition)**

| Work Stage | Risk Rating | Control Measures |
|---|---|---|
| Piling | HIGH | • Avoid evening and night-time periods and Sundays/public holidays<br>• Prioritise piling methods that minimise noise and vibration (e.g. augured, screw or press-in piles rather than drop-hammer, impact hammer or vibratory methods)<br>• For bored piling, avoid shaking the auger to remove spoil where practicable. Shaking the kelly bit connection creates very loud banging that often results in noise complaints. If spoil does not fall off the auger easily, use tools to scrape the auger clean if necessary. If shaking is required due to Health and Safety constraints, ensure bushes are well maintained to minimise steel on steel contact.<br>• For impact piling methods, use a non-metallic (i.e. wooden or plastic) dolly or cushion cap between the hammer and the driving helmet |
| All other activities | LOW | • Avoid unnecessary noise. This means managing the site to ensure:<br>o No unnecessary use of horns<br>o No rough handling of material and equipment<br>o No banging or shaking excavator buckets<br>o No unnecessary steel on steel contact (e.g. during the loading of scaffolding on trucks)<br>o No high engine revs. This includes choosing the right sized equipment and turning engines off when idle.<br>• Mitigate track squeal from tracked equipment, such as excavators. This may include tensioning and watering or lubricating the tracks regularly<br>• Locate stationary equipment (e.g. generators) away from noise sensitive receivers and/or screen them behind site buildings and material stores<br>• Orient mobile machinery to maximise the distance between the engine exhaust and the nearest sensitive building façade (e.g. excavators) |

## 12.4 Monitoring and reporting

### 12.4.1 Monitoring

Construction noise will be monitored:

- In response to a reasonable noise complaint
- At 1m from the building façade facing the construction site, or a proxy position adjusted for distance
- By a suitably qualified and experienced specialist (e.g. Member of the Acoustical Society of New Zealand) in accordance with the requirements of New Zealand Standard NZS 6803: 1999 "Acoustics - Construction Noise"
- For an appropriate duration, reported with the measured level (e.g. 65 dB LAeq (30min))

The results will be used to update the CEMP if appropriate.

### 12.4.2 Reporting

The Contractor shall maintain a record of completed noise monitoring logs as well as any incident or complaint investigations. These records shall be completed and provided to the Northport Project Manager at least once a week.

Complaints will be acknowledged immediately where practicable and responded to as soon as practicable. If a more detailed response is needed, it will be provided within a timeframe agreed with the complainant.

For each complaint, an investigation will be undertaken as soon as practicable using the following steps:

- Acknowledge receipt of the concern or complaint and record:
    - The name, address and contact details of the complainant (unless they elect not to provide)
    - Time and date the complaint was received and who received it
    - Time and date of the activity that caused the complaint (estimated where not known)
    - The complainant's description of the activity and its resulting effects
    - Any relief sought by the complainant (e.g. scheduling of the activity)
- Identify the relevant activity and review the activity log to verify the complaint (or otherwise)
- Review data from monitoring (if available) to identify the time in question and, if possible, verify exceedance
- Review the predicted noise levels to determine if the activity was identified. Consider attended monitoring to verify the underlying reference level assumptions
- Review the mitigation and management measures in place to ensure the BPO has been applied (Section **Error! Reference source not found.**). Review the relief sought by the complainant. Adopt further mitigation and management measures as appropriate.
- Review the potential residual effects if predicted to continue to exceed the relevant performance standards

- Report the findings and recommendations to the Project Manager, implement changes and update this CNMP as appropriate

Report the outcomes of the investigation to the complainant, identifying where the relief sought by the complainant has been adopted or the reason(s) otherwise.

All construction noise complaints will be recorded in a complaints file that is available to affected parties and Council on request.

## 12.5 Contingency

Complaints must be managed using the complaints process. During works there must always be a delegated person available to discuss noise issues with the Northport Project Manager and take immediate action as required. The Contractor shall detail the delegated person before commencing construction activities.

# 13 Marine biosecurity

It is likely a number of the machinery used in the construction of the reclamation and wharfs will be from overseas contractors. A Biosecurity Management Plan (BMP) shall be prepared before construction commences and include measures to reduce the potential of marine biosecurity risk from ballast water, sediments and biofouling. In particular the plan shall include:

- Description of the vessels expected to be employed during reclamation construction and its attributes that affect risk (e.g. voyage speed, maintenance history, prior inspection, voyage history since last dry-docking and antifouling)
- Description of the key sources of potential marine biosecurity risk from ballast water, sediments and biofouling
- Findings from previous inspections
- A description of the risk mitigation taken prior to arrival in New Zealand
- The nature and extent of pre-border inspection that will be undertaken to verify compliance with Import Health Standard (IHS) and Craft Risk Management Standard (CRMS);
- Record keeping and documentation of all mitigation undertaken to enable border verification if requested by Ministry of Primary Industries and to facilitate final clearance.

# 14 Communication

## 14.1 Within the project team

Reporting between the Contractor and Northport will occur at a specified frequency as determined during project planning. An example of the reporting frequency is shown in **Table 14-1**.

**Table 14-1: Reporting requirements to the Northport Project Manager**

| Frequency | Requirements |
|---|---|
| Weekly | |
| As required | |

## 14.2 Complaints procedure

The following procedure shall be followed for all complaints:

- All complaints should be immediately directed to the person listed in the Section 2 or the Northport Project Manager.
- It is important that any interaction with the complainant is polite and does not belittle their concern
- As soon as the complaint is received it will be recorded on the project complaints register (**Appendix C**). Note there are specific requirements for what is to be recorded for dust in the Dust Management Technical Chapter
- An initial response will be made and recorded. Depending on the nature of the complaint the initial response could be to immediately cease the type of work pending investigation, replace an item of equipment, apply additional control (e.g. water sprayer for dust), or reinstate a damaged control device. However, in some cases it might not be practicable to provide immediate relief. Northport and the complainant will be informed of actions taken
- Where the initial response does not address the complaint, the Northport Project Manager will be informed and will undertake (either themselves or delegated to the Contractor) further investigation, corrective action and follow-up monitoring as appropriate. The complainant will be advised of the outcome of this process
- All actions will be recorded on the project complaints register and the complaint will then be closed

## 14.3 Documentation

All paper/electronic files relating to the CEMP will be kept in the Site Office. This will include:

- The CEMP and associated documentation (e.g. Safety Data Sheets for hazardous substances; type of work-specific noise schedules etc.);
- Consultation and complaints registers
- Monitoring data
- Signed induction records which show that people inducted onto site understand what is required of them under the CEMP

# 15 Updating the CEMP

To maintain relevance, the CEMP must be reviewed when any changes to the methodology are made and updated accordingly. Any changes must be made in accordance with the relevant conditions outlined in resource consent XXX.

This CEMP must be amended if:

- The scope of your works or methodology is going to change
- The mitigation measures are not working sufficiently
- Responsible parties change
- The season or time of day in which the works need to take place changes;
- The area of works increases or changes
- You have identified improvements to the process or mitigation measures;
- The duration of your works changes

Anything else changes that alters the effectiveness of your CEMP to manage the negative environmental effects of your works.

Changes to the CEMP can be logged in **Table 1-2** located in Section 1.

# 16 Applicability

Enviser Ltd has prepared this report for Northport Limited to assist in managing the construction effects of the eastern development in accordance with the agreed scope. No other party, aside from Northport and its contractors, may rely on this report, or any conclusions or opinions within it, for the management of construction effects without the express written permission of Enviser Ltd. This does not preclude the use of this report to inform the consenting of the project.

The opinions and conclusions within this report are based on the information that was viewed during preparation of the report.

| Prepared for Enviser Ltd by: | Authorised for Enviser Ltd by: |
|---|---|
| Alison Peters<br>Environmental Consultant<br>BSc, PGDip (Eng. Geol) | Jared Pettersson<br>Environmental Engineer<br>CPEng, MIPENZ, IntPE |

# 17 Appendices

# Appendix A – Risk assessment tools

**Table A-1: Risk assessment matrix**

| | | Impact | | | | |
|---|---|---|---|---|---|---|
| | | **Insignificant** | **Minor** | **Moderate** | **Major** | **Extreme** |
| **Likelihood** | **Almost Certain** | Medium | High | High | Very High | Very High |
| | **Likely** | Medium | Medium | High | Very High | Very High |
| | **Possible** | Low | Medium | High | High | Very High |
| | **Unlikely** | Low | Low | Medium | High | High |
| | **Very Unlikely** | N/A | Low | Medium | Medium | High |

**Table A-2: Risk impact definitions**

| Element | Insignificant | Minor | Moderate | Major | Extreme |
|---|---|---|---|---|---|
| **Environmental** | | Moderate effects on biological or physical environment but little or quickly remedied impact to ecosystem.<br>Short term reversible damage | Serious environmental effects such as displacement of species and partial impairment of ecosystem.<br>Reversible but widespread medium-term impact/damage. | Significant impact on highly valued species or habitats.<br>Reversible, but long-term damage. Some impact not reversible | Long term destruction of highly significant ecosystem or very significant effects on endangered species or habitat.<br>Irreversible damage. |
| **Legislative** | | Minor non-compliance with no legal / regulatory requirements. | Non-compliance with legal / regulatory requirements, or cessation of works. | Non-compliance with enforcement action, possible prosecution. | Prosecution. |
| **Financial** | Operational cost overrun up to $2% | Operational cost overrun of between $2% and $5% | Operational cost overrun of between $5% and $25% | Operational cost overrun of between $25% and $50% | Operational cost overrun greater than $50%. |

| Element | Insignificant | Minor | Moderate | Major | Extreme |
|---|---|---|---|---|---|
| **Reputational / Image** | No or negligible (one-off) media coverage or comment. | Minor short term media coverage with negative correlation and small/local audience | Negative media coverage with broader audience (regional and/or some national coverage) and involving more than one media agent. Short term focus (<5days). | Negative national media coverage with extended coverage (>5days) involving multiple news and media agents. | Sustained negative national and/or international media coverage, with focus investigative segments, re-occurring coverage and involving multiple news and media agents. |
| **Customers** | Negligible or isolated impact to customer(s) with no impact to normal levels of complaints | Impact to small groups of customers with some notable trend/similarity in complaints. | Community group impact with formal/justifiable complaints lodged or complaints in relation to public health. | A number of community groups affected (e.g. with some protest action) | Widespread impact to city population. |

**Table A-3: Risk likelihood definitions**

| Rating | Probability | Description |
|---|---|---|
| **Almost Certain** | > 90% | Virtually guaranteed to occur |
| **Likely** | > 70% | Will probably occur in most circumstances |
| **Possible** | > 40% | Common occurrence |
| **Unlikely** | > 10% | Could occur at some stage |
| **Very Unlikely** | < 10% | Some history of occurrence |

# Appendix B –Inspection Checklists & Logs

**B-1: Daily Dust Log**

***Daily Dust Inspection Log***

Date: _____ Time: _____

Inspection by: _____

Current weather conditions (e.g., sunny, cloudy, rainy):_____

Wind speed and direction (e.g., light, moderate, strong):_____

Weather forecast for next 24 hours (e.g., rainy, windy):_____

Area(s) inspected: _____

| Scope of Inspection | Circle Relevant Item | Comments |
|---|---|---|
| Is there visible dust from site work activities, stockpiles, earthworks areas or haul roads? | Y N N/A | |
| Are unsealed surfaces dry and need spraying with water cart? | Y N N/A | |
| Are any exposed earthworks visibly dry and need water spray? | Y N N/A | |
| Stockpiles covered/stabilised where needed? | Y N N/A | |
| Are there any signs of dust going off site as a result of site activities?<br>[Inspect land adjacent to the site exits and adjoining roads for the presence of dust deposits.] | Y N N/A | |
| If wind speeds are strong or forecast to be strong (over 5 m/s) are additional inspections, activity restrictions and mitigation measures being put in place? (e.g., increase water application, restrictions on dusty activities) | Y N N/A | |
| Are watering systems (e.g., water carts, wheel wash) operating effectively to minimise dust? | Y N N/A | |
| Are trucks carrying loose (uncovered) material entering or leaving the site? | Y N N/A | |

| Scope of Inspection | Circle Relevant Item | Comments |
|---|---|---|
| How frequently has water sprinkling/spraying been used today (i.e., number of water carts, time, area watered) | | |
| Note and dust control equipment malfunctions (and remedial actions taken as appropriate) | | |
| Any unusual on-site activities today? | | |
| Complaints received / community feedback | | |

**B-2: Sediment plume inspection sheet**

| Sediment Plume Monitoring | |
|---|---|
| **Project name:** | |
| **Inspector:** | |
| **Date:** | |
| **Time:** | |
| **Monitoring period:** | Record start/end time |
| **Weather at time of inspection:** | E.g. clear, cloudy, rain, high winds, other |
| **Type of inspection:** | E.g. scheduled, post-storm |
| **Construction activities prior to monitoring event:** | |
| **Monitoring standard** | **Comments** |
| The exact performance standards will be set either in resource consent conditions or from the permitted activity standard (13.3.13 General Performance Standards) | |
| **Photographs:** | Include plume extents and features of note. |

# Appendix C – Complaint form and register

**D-1: Dust Complaint form**

## PART B: Complainant Location Assessment

Date: Time: Assessors Name:

Person spoken to at complaint location: Reason for investigation: COMPLAINT/PROACTIVE

Complaint details (include impacts/effects experienced by complainant:

**INITIAL IMPRESSIONS:**

Type of dust

Time of the intial impression:

Any visible dust deposits: Y/N Plume width (if known):

**VISIBLE DUST DEPOSITS**

Describe approximate quantites and extent

When was surface last cleaned? Frequency of cleaning:

Describe the appearance of the deposits:

| | | | |
|---|---|---|---|
| Colour | | Any odour | |
| Shape | | Water soluble | |
| Size | | Other | |
| Crystalline or powdery | | | |
| Hard, soft | | | |

**Weather Data (see over)**

| |
|---|
| Wind direction: |
| Wind velocity: |
| Cloud cover: |
| Temperature: |
| Rainfall in past 24 hrs: |

Photos Taken: Y/N Samples taken Y/N

Diagram/description of where photos were taken.

Diagram/description of where samples were taken:

Sample collection: Use a small paintbrush (clean) to sweep samples of the dust onto a sheet of paper and then into a clean plastic bag. At least half a teaspoonful will be required for analysis. Lesser amounts may be colected on strips of clear cellotape, which should then be stuck onto sheets of clear plastic to preserve the samples. Label all samples and record date, time, location, etc on a separate sheet of paper if required.

***Based on your assessment on this occasion, which of the following applies:***

- ☐ I did not find any dust
- ☐ I did find dust and consider it would not be objectionable at any location for any duration or frequency
- ☐ I did find dust and consider it would be objectionable if it became continuous
- ☐ I did find dust and consider it would be objectionable if it occurred on a regular or frequent basis
- ☐ I did detect dust and consider it to be objectionable even in periods of short duration.

**FINAL CHECKLIST**

- ☐ Upwind assessment completed. Record details below. If not, detail reason: _____
- ☐ Aerial photo/sketch showing location of assessment and upwind assessment attached
- ☐ Are there potential witness statements to obtain YES/NO

**REMARKS**

## PART C: Off-site dust and 360° assessment

Assess the dust upwind of the suspected source and if possible conduct a 360° sweep around the source assessing the odour at different points

**OTHER POTENTIAL SOURCES** **Time:** _____

Check for road works, ploughing, construction activities, burn-offs, unsealed roads, unsealed sites

**Site 1:**

Wind direction: Wind strength: Wind stability: GPS Loc:
Visible dust: Desciption of dust
Comment:

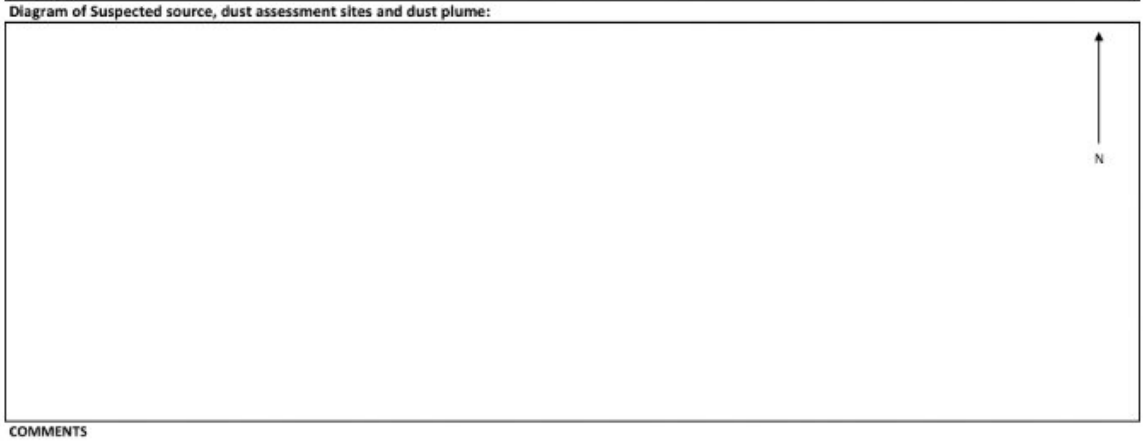
**Site 2:**

Wind direction: Wind strength: Wind stability: GPS Loc:
Visible dust: Desciption of dust:
Comment:

**Site 3:**

Wind direction: Wind strength: Wind stability: GPS Loc:
Visible dust: Description of dust:
Comment:

**Diagram of Suspected source, dust assessment sites and dust plume:**




**COMMENTS**

## PART D: Source On-site Investigation

If source of dust identified, visit site, identify yourself and show warrant. Explain the findings of your investigation to staff.

Date: Time: Source Identified:

Staff spoken to:: Position:

Staff contact phone number:

Current site operations:

Reason/explanation given for dust

Other Comments

Site Sketch (If Required)


SIGNED BY ASSESSOR _____ DATE: _____

## PART E: Dust Reference Sheet

**Definitions**

**Objectionable** The term objectionable is the term used in consent conditions and is an ingredient of any subsequent enforcement action. It is a subjective term and is open to interpretation. There is guidance from case law which defines objectionable as: unpleasant or offensive or repugnant; open to objection or undesirable or disapproved of; noxious or dangerous. A test will be applied by the court that the term objectionable will be as it applies to "the minds of a significant cross section of reasonable people in the community". The assessor must bear this test in mind when completing their assessment.

**Frequency** How often an individual is exposed to dust nuisance events

**Intensity** As indicated by dust quantity/concentration and the degree of nuisance

**Duration** The length of the particular dust event

**Character** How objectionable the dust is, having regard to the nature of the dust

**Land Beaufort Wind Scale**

| B. No. | Description | How to Recognise |
|---|---|---|
| 0 | Calm | Smoke rises straight up |
| 1 | Light Air | Smoke drifts |
| 2 | Light Breeze | Wind felt on face; leaves rustle |
| 3 | Gentle Breeze | Flags flap; twigs move all the time |
| 4 | Moderate Breeze | Papers blow; small branches move |
| 5 | Fresh Breeze | Small trees sway |
| 6 | Strong Breeze | Large branches move, wind whistles |
| 7 | Near Gale | Whole trees sway |

**Measuring Temperature**

Use descriptions below or obtain local meterological data, especially temperature from websites such as www.metservice.govt.nz

| |
|---|
| Cold |
| Cool |
| Mild |
| Warm |
| Hot |

**Measuring Cloud Cover**

| Okta No. | Description |
|---|---|
| 0 | Clear Sky |
| 1 | Sunny |
| 2 | Mostly sunny |
| 3 | |
| 4 | Half the sky is covered in cloud |
| 5 | |
| 6 | Mostly cloudy |
| 7 | Considerable cloudiness |
| 8 | Overcast |
| F | Fog / Mist |

During the day the sun is always shining, so the amount of sunshine reaching the ground depends on the amount and duration of any cloud cover. The amount of cloud cover is usually given in units called oktas. Each okta represents one eighth of the sky covered by cloud.

**D-1: Complaint register**

To be completed by the Contractor and integrated into Northport's existing electronic complaints register

# Appendix D – Safety Data Sheets

To be completed by Contractor

# Appendix E - Accidental Discovery Protocol

To be added in consultation with Project Archaeologist

enviser

Enviser Ref:1116
September 2022

# DRAFT MARINE MAMMAL MANAGEMENT PLAN

## PROPOSED RECLAMATION AND WHARF

Northport Ltd

# Contents

# Foreword

This plan has been collated by Enviser Limited with technical input provided by the following:

- Deanna Clement, Marine Mammal Expert, Cawthron
- Matt Pine, Underwater Acoustics and Marine Mammal Monitoring Expert, Styles Group Ltd

# Abbreviations

**MMMP:** Marine Mammal Management Plan (this plan)
**TTS:** Temporary auditory Threshold Shift
**PTS:** Permanent auditory Threshold Shift
**MMO:** Marine Mammal Observer
**MMOZ:** Marine Mammal Observation Zone
**EMMOZ:** Extended Marine Mammal Observation Zone

# 1 Introduction

## 1.1 Purpose of the MMMP

Northport Limited (NPL) is proposing reclaiming land to expand its facilities in Whangārei Harbour and the Port's capacity to support the regional economic growth of Northland and northern Auckland.

There is potential for the construction activities, particularly pile driving and dredging, to have effects on the marine mammal species that live or pass through the north-eastern coastal waters of the North Island. The species most likely to be present in the vicinity of the project area are bottlenose and common dolphins, orca and Bryde's whales. Other species of interest include New Zealand fur seals, leopard seals, and southern right and humpback whales which are seasonal visitors to the wider Bream Bay area.

The potential effects on marine mammals were comprehensively assessed (Clement 2021) and physical hearing injuries and/or habitat avoidance (due to the associated increase in underwater noise production from pile-driving and dredging activities) were identified as potential direct effects. Vessel strike and possible entanglement were identified as potential indirect effects of the reclamation works.

This MMMP describes the management actions and monitoring that will be employed during the reclamation works to minimise effects on marine mammal species.

## 1.2 Roles and responsibilities

Table 1 summarises NPL's key project staff and contact details for each. The Project Director is ultimately responsible for implementing this MMMP.

It is the responsibility of NPL to ensure that the Contractor understands and can implement the requirements of this MMMP. The Contractor is responsible for training their staff and ensuring that they understand and can implement the requirements of the MMMP.

**Table 1:** Summary of key contacts, roles and responsibilities

| Name | Role/Responsibility | Organisation | Contact details |
|---|---|---|---|
| XXX | Project Environmental Adviser | XX | XXX |
| Dr Deanna Clement | Project Marine Mammal Specialist | Cawthron Institute | deanna.clement@cawthron.org.nz |
| Dr Matt Pine | Project Underwater Noise Specialist | Styles Group | Matthew@stylesgroup.co.nz |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## 1.3 Training Requirements

To ensure construction crew are aware of the risks and the necessary management actions, all crew will attend the Marine Mammal Observation toolbox talk. This will be given by the Project Marine Mammal Expert (Deanna Clement, Cawthron) and the Project Environmental Adviser (Jared Pettersson, Enviser Limited).

The Contractor will record training attendance. The Project Environmental Adviser will train other relevant project personnel (i.e., site supervisors, project engineers, etc) as required and whenever new crew commence work on the project.

Reminders and updated information will be provided throughout the project.

## 1.4 Regulatory requirements (TBC)

The management of effects on marine mammals is subject to the provisions of the Resource Management Act 1991, New Zealand Coastal Policy Statement and the Regional Coastal Plan for Northland.

The reclamation, including the marine piling, requires consent under the Regional Coastal Plan for Northland. Accordingly, NPL is seeking/sought and received consents for the construction activities, these are listed below:

- XXXXXX
- XXXXXX
- XXXXXX
- XXXXXX

## 1.5 Updating the MMMP

This MMMP shall be implemented throughout the piling and dredging works. It shall be considered a 'living document' that is expanded and updated as the Project progresses.

At the commencement of any construction activities, noise validation will be completed and the MMMP updated to ensure all noise management actions are appropriate.

Shut-down zones will be established around the construction area to minimise any risk of hearing impairment (i.e., TTS) to marine mammals from pile-driving activities[1]. The final size of these zone(s) will be confirmed once construction methodologies are confirmed and *in situ* sound levels are verified.

To maintain relevance, this Plan must also be reviewed at the following times and amended where necessary:

- Following collation and reporting of the behavioural and noise monitoring data and before any subsequent seasonal piling stage, particularly the second summer season.
- Following any marine mammal entanglement incident or near incident.
- At the completion of each piling stage.

[1] Shut-down zones for dredging activities are not considered necessary based on predicted noise levels and relative to other similar and relevant dredging consents, i.e., Refining New Zealand's deepening and realignment of Whangārei Harbour channel entrance. Any significant differences in actual dredging noise levels may necessitate reconsideration of a shut-down zone option.

- If the size or length of the pile changes or the piling method during the project.
- As any new marine mammal sighting or information data as it becomes available.
- If three or more shut-downs (due to the presence of marine mammals entering the shut - down zones during piling) occur within three consecutive days.

Following any update, the MMMP will be provided to the Northland Regional Council for certification.

# 2 Project description

The project comprises reclamation of land to the east of the existing port area, associated wharves and dredging. Once constructed, the reclamation will cover approximately 14 hectares and provide space for additional container storage, handling and transportation.

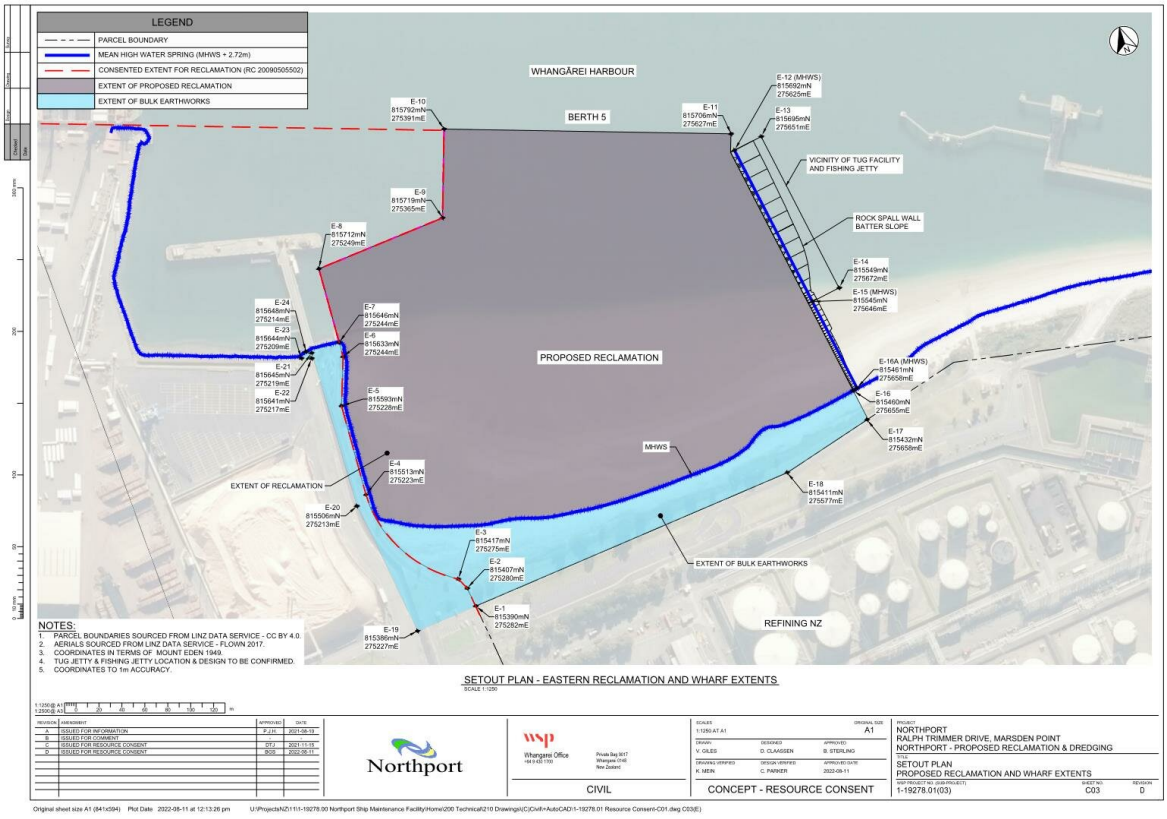



***Figure 1:*** *Layout of the reclamation footprint (grey area). Note: the gap between the proposed reclamation (grey area) and the existing port (yellow area) is the already consented but not constructed Berth 4 reclamation of 4.3ha and wharf of 270m length. (Source: WSP, 2022).*

### 2.1.1 Land reclamation

It is anticipated the reclamation will be built using techniques used by NPL for previous reclamations. Broadly, sand and silts gathered from dredging are used to reclaim land behind a rock bunded wall, with some imported material used where needed. The land construction sequence is generally the same for both scenarios with the anticipated methodology set out below:

- The rip-rap protected batter slope will be built as a bund, using land-based plant (i.e., excavators, trucks etc) from the shore and out to approximately mean low water springs. A temporary rock bund would then connect the reclamation with the current Northport land.
- Once the rock bunded area is complete (and/or alternative measures such as silt curtains are installed), dredged material (as a slurry) will be pumped from the dredger and discharged into the reclamation area where the solids quickly settle out.
- A series of internal paddocks may be needed to settle out the finer-grained materials before residual sediments are discharged to the adjacent water. The discharge is expected to be via the existing stormwater discharge diffuser located under Berth 1.

### 2.1.2 Piling methodology (TBC)

*Yet to be confirmed.*

### 2.1.3 Dredging methodology

Total dredged material volumes for the reclamation are anticipated to be approximately 1.4 million $m^3$.

Three dredging methods are available – two methods to dredge the bulk volume in the swing basin and another to dredge close to berth pockets and construction-related dredging. The swing basin dredging will likely be undertaken by either a cutter suction dredger (CSD) or a trailer-hopper suction dredger (THSD) or both. All other dredging will likely be undertaken using a backhoe dredge (BHD).

The duration of the dredging programme is dependent upon the equipment used but is expected to be in the order of a few months.

### 2.1.4 Marine structures and methodology

To provide berthage for ships, several marine structures are proposed. Structures will include:

- Revetment and seawalls – rock or concrete blocks or combination of sheet piling and rock armour.
- Wharves built using driven piles (steel or concrete) with a cast in situ reinforced concrete deck and seawalls.

### 2.1.5 Timeframes

**Table 2:** Piling work timeframes

| Piling phase | Dredging phase | Start date | Duration |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# 3 Environmental risk summary

The potential risks to marine mammals associated with the underwater noise generated by general construction, pile-driving and dredging activities (along with other effects) have been separately and comprehensively evaluated (Clement 2021). A summary of the evaluation is presented below in Table 3.

**Table 3:** Summary of potential effects on relevant marine mammal species (adapted from Clement 2021).

| **Potential effect** | | **Likelihood of effect** | **Significance level of unmitigated effect** | **Significance level of residual effect** |
|---|---|---|---|---|
| **General construction activities** | | | | |
| | Behavioural/masking | NA/Low | Nil to negligible | Nil to negligible |
| | Physical injury (TTS) | NA/Low | Nil to negligible | Nil to negligible |
| **Pile-driving activities** | | | | |
| | Physical injury (PTS/TTS) | Low | Less than minor to more than minor | Nil to Negligible |
| | Displacement effects | Moderate | Less than minor to Minor | Negligible to Less than minor |
| **Dredging activities** | | | | |
| | Behavioural/masking | Low to moderate | Nil to Less than minor | Nil to Less than minor |
| | Physical injury (PTS/TTS) | NA | Nil to Less than minor | Nil to Less than minor |
| **Other potential effects** | | | | |
| | Vessel strike | Low | Less than minor to More than minor | Negligible to Less than minor |
| | Entanglement | NA to Low | Nil to Less than minor | Nil to Negligible |

**Table notes:**

Likelihood of effect: Not Applicable (NA), Low (< 25%), Moderate (25–75%), High (> 75%)

Significance level: Nil (no effects at all), Negligible (effect too small to be discernible or of concern), Less than Minor (discernible effect but too small to affect others), Minor (noticeable but will not cause any significant adverse effects), More than Minor (noticeable that may cause adverse impact but could be mitigated), Significant (noticeable and will have serious adverse impact but could be potential for mitigation).

TTS: Temporary auditory threshold shift

PTS: Permanent auditory threshold shift.

# 4 Control measures

The scale of the construction activities, the expected noise levels, and the extended timeline of the proposal (more than 2.5 years in total) necessitate appropriate control measures to safeguard local and visiting marine mammals.

The main activity with the potential to adversely affect marine mammals is underwater noise from pile driving and to a lesser extent, dredging (Clement 2021). Vessel strike and possible entanglement are considered low risk and are discussed separately.

The key recommended control measures and actions are outlined in four sections:

- Operational Best Management Practices
- Control measures to minimise pile-driving effects
- Control measures to minimise dredging effects
- Control measures to minimise other effects

These measures are summarised in Table 4 and described in more detail in the following sections.

**Table 4:** Proposed management of adverse effects of construction activities on marine mammals in Whangārei Harbour (adapted from Clement 2021).

DOC = Department of Conservation, NRC = Northland Regional Council. BPO = best practical option.

| Potential effects | Management goal | Proposed Management Measures | Reporting/monitoring |
|---|---|---|---|
| Physical and/or behavioural responses to underwater sound from construction activities | Avoid acoustic injury and minimise disturbance to marine mammals | **Dredging activities**<br>• Regular maintenance of all dredging equipment and any associated vessels to reduce noise and vibration, including maintaining and lubricating rotating parts, as required.<br><br>**Pile-driving activities**<br>• Regular maintenance of all pile-driving equipment and any associated vessels to reduce noise and vibration, including maintaining and lubricating rotating parts, as required.<br>• Adopt soft-start/ramping-up procedures and choose plant/techniques on the basis of minimisation of underwater noise levels (e.g., vibro-driving preferred over impact-driving).<br>• Designated shut-down zones with dedicated, experienced marine mammal observer(s) to maintain a watch before, during and after any pile-driving activities (during daylight hours only).<br>• Minimise the spread of piling stages over successive seasons. | • Measure actual underwater noise levels from pile driving, dredging and other construction activities as soon as practical if they are found to be different than estimated models, the size of the marine mammal observation zone will be adjusted accordingly.<br>• Record and report the type and frequency of any marine mammal sightings (i.e., visual and acoustic) and interactions before, during and after pile-driving activities (including absences and effort), in a standardised format. Annual records provided to DOC and NRC and made publicly available (e.g., web). Include behavioural data if possible.<br>• Any project sightings should be reported to DOC for input to their national database. |
| Vessel strike due to increased vessel activity | Minimise the risk of vessel collisions with any marine mammal and aim for zero injury/mortality | • Encourage port-related ships to adopt best boating guidelines for marine mammals (see Appendix B).<br>• Formally support a similar protocol to the Hauraki Gulf Transit Protocol for Commercial Shipping that includes speed limits, crew watches and reporting of sightings to reduce any chances of mortality from vessel strikes. | • Consistent with the Hauraki Gulf's voluntary shipping protocol, NPL will maintain records of all reported vessel strike incidents or near incidents regardless of outcome.<br>• In case of a fatal marine mammal incident, carcass(es) recovered (if possible) and further steps taken in consultation with DOC and tangata whenua. |
| Marine mammal entanglement in operational gear and / or debris | Minimise entanglement and aim for zero mortality | • Avoid loose rope and/or nets (i.e., keep all ropes and nets taut). All deck lines should be tied up when not in use or under some degree of tension.<br>• Regular maintenance/inspection of properly tensioned silt curtains or other sediment containment gear.<br>• Ensure that all support vessels and other project activities have waste management plans in place.<br>• Record all entanglement incidents or near incidents regardless of outcome (e.g., injury or mortality). | • Nothing required, self-checking with up-to-date records available.<br>• In case of a fatal marine mammal incident, carcass(es) recovered and further steps taken in consultation with DOC and tangata whenua. |

## 4.1 Operational Best Management Practices

During all phases of the Project, the general principle guiding vessel operations will be to avoid, as far as practicable, any interaction with marine mammals. To minimise the attraction (or abandonment) of marine mammals to the project area, the Contractor will follow these operational management practices:

- Crew members are not permitted to carry out activities that could attract marine mammals to the project site (e.g., fishing) or feeding other wildlife (e.g., birds, fish).
- Minimising above-water and underwater noise to reduce the attraction of marine wildlife.
- Regular maintenance of all in-water equipment and vessels (e.g., lubrication and repair of winches, generators) to reduce the production of underwater noise. Regular maintenance records should be kept up-to-date and available for NRC or DOC to review upon request.
- Ensure that all noise suppression equipment, such as mufflers and ventilation baffles are maintained in good working order.
- Use only the minimal amount of artificial lighting necessary to reduce attraction of prey fish and predators
- Adhere to best boating guidelines around marine mammals by any project vessels to minimise any avoidance responses.

## 4.2 Control measures to minimise pile-driving effects

Marine mammals use sound for communication, orientation, foraging and predator avoidance. An increase in underwater noise can impact marine mammals, resulting in avoidance of noisy areas, behavioural changes, auditory masking, or physical injury. Because of the low to moderate risk rating and the potential for several noise-sensitive species to occur in the harbour area, the following control measures will be employed to manage the risks of pile-driving activities on marine mammals:

- Adoption of Best Practicable Option for noise emissions
- Verification of the *in-situ* noise levels produced from pile-driving activities
- Monitoring by trained Marine Mammal Observers (MMOs) and establishment of observation and shut-down zones
- Establishment of central contact point with DOC and with local and regional marinas (discussed in Section 6)

### 4.2.1 Best Practicable Option for noise emissions

Adopting the best practicable option for noise emissions is the most effective option for minimising underwater noise in the first instance. For this project, adhering to the best practical option would mean selecting the piling method with the lowest underwater noise output that is able to practically and cost effectively complete the work. However, full consideration must be given to other environmental factors such as substrate type and the implications of extending the duration of piling (e.g., one method may be quieter than another, but it may take longer to complete works).

The following will be considered to reduce source noise and establish the best practicable option:

- Evaluate new developments in piling technology and alternative piling or mitigation methods (e.g., augering, bottom driving, etc.) that could reduce the overall noise footprint.
- Using the smallest possible pile size that meets the operational need. The smaller the pile, generally the lower the noise level, subject to different piling methodologies.
- The use of ‘soft- start’ or ‘ramping up’ procedures (as described in Section 4.2.6.2), in which pile-driving energy is gradually increased to normal operating levels, to give nearby animals (i.e. close to or just outside the marine mammal observation zone (MMOZ)) an opportunity to move away from the area before sound levels increase to an extent that may cause discomfort or injury. This process is also expected to help mediate more moderate and some low behavioural responses from nearby animals, giving them a chance to habituate to the pulses of sound over time before increasing the noise level.

- Use of a sacrificial, non-metallic (e.g., timber) hammer cushion cap between the hammer and the top of the pile to reduce wear.
- Use vibration driving methods where possible to minimise impact driving
- Modifying the pile strike by changing the contact time of the hammer can theoretically reduce the noise generated by the impact through a reduction in the amplitude of the pile vibration. If used, this modification needs to be tested in the context of this proposal and will likely need to be used in combination with other proposed actions to result in any significant reduction.

### 4.2.2 Verification of *in-situ* underwater noise levels

Acoustic monitoring to characterise *in-situ* noise levels should be undertaken as soon as possible once works commence to confirm that the actual noise levels associated with activities are as expected. Using these measurements, the predictive underwater noise propagation modelling (Pine 2021) will be validated by the Underwater Noise Specialist. The Marine Mammal Specialist will then recommend any modifications to the proposed management measures (i.e., size of shut-down zones).

### 4.2.3 Methods to characterise noise

To characterise the underwater noise, measurements of the underwater noise shall be taken as soon as practicable and during normal operating conditions:

- on each of the different pile diameters used
- during the sediment extraction phase (for all dredge types), from when the bucket/drag-head/cutter-head enters the water and sediment is being loaded into the hopper/barge.
- during pumping of sediment to shore.
- for sufficient time to characterise the noise produced by the piling activity
- measured as the single strike Sound Exposure Level (SEL) that will be accumulated over a 24-hr period.
- SEL shall be derived from the maximum combined noise within mid-to-higher water depths (not the surficial layer), from the impact driven and vibro-driven piling operations over sufficient time to obtain sufficient SELs for the day.

The methodology for collecting the underwater noise measurements should include:

- Measurements taken during good weather conditions (Beaufort scale 0-3) to minimise natural noise sources (waves etc).
- Soundtrap HF autonomous recorders to continuously record all sounds from these same fixed locations, using the following method:
    - Installation of the recorders on the bottom-mounted moorings.
    - Moorings will be selected to capture the noise at various locations in the Harbour and at varying distances from the source.
    - The recorders will be attached to the line in a way which prevents noise contamination from the mooring or the connection to the mooring.
    - Recordings shall be collected for a duration of at least one month during each type of piling.
- Additional mobile noise measurements will be collected, also using SoundTrap HF recorders. This will be achieved by:
    - Deploying a recorder(s) from a small vessel with a tether to reduce noise contamination from the vessel.
    - Measure sound at multiple locations around the pile driving source (i.e., multiple bearings), multiple distances (log based, i.e., 50m, 100m, 200m, 500m, 1000m) and at two depths for each location: 1-2m and 5m or mid depth in shallow water locations. Noting that harbour geometry, navigation issues and water depth will restrict the placement of instruments.
    - Recordings should be of sufficient duration to capture the variations in piling noise during pile driving.

- Noise levels will be measured to compare with the TTS criteria for ground-truthing and development of underwater noise propagation models.

### 4.2.4 Establish a Marine Mammal Observation Zone

Based on the worst-case modelling scenarios for 914-mm diameter piles, it is recommended that two different marine mammal observation zones be established:

1. A main marine mammal observation zone (MMOZ) that goes out to 200 m from the source and that will protect bottlenose and common dolphins, orca and fur seals; species that visit harbour waters throughout the year.
2. An extended zone (EMMOZ) of approximately 800 m for baleen whales and leopard seals.

Monitoring of the MMOZ will involve at least one dedicated, experienced marine mammal observer (MMO) maintaining an effective lookout station at an elevated, fixed platform near the piling site. The MMO will be continuously scanning for the presence of marine mammals prior to, during and following any pile-driving activities (which will take place during daylight hours only).

All efforts should be made by MMOs to regularly scan areas further out from the designated MMOZ for any unexpected sighting of baleen whales or a leopard seal. If any sightings of these species are observed outside the MMOZ, piling should be halted as animals are likely to be within the zone for TTS, and the EMMOZ implemented instead. If more than two unexpected sightings of these species are made by the MMO outside the MMOZ, this situation will trigger a review of the MMMP and the MMOZ criteria with consideration given to potentially using the larger EMMOZ as the main shut-down zone.

### 4.2.5 Extended marine mammal observation zone (EMMOZ)

It is anticipated that this zone will be only used between July and September when baleen whales are in the region or when a leopard seal has been sighted near Whangārei (e.g., over the winter and autumn months, respectively).

Based on communication with DOC and social media, the larger EMMOZ will be temporarily enacted after the first sighting of a whale or leopard seal in the wider Whangārei region (i.e., Bream Bay to Tutukaka). The EMMOZ will continue to be monitored for at least 48 hrs or until further sightings have been confirmed. After 48 hrs, with no further confirmed whale or leopard seal sightings, the MMOZ shut-down zone will be reinstated.

Monitoring the larger EMMOZ will require at least two dedicated MMOs (one near the piling source and another at the 800 m boundary and/or near the harbour entrance). The Port will need to consider and assess whether more remote technologies (e.g., drones, real-time hydrophones, camera systems) may offer better or more comprehensive monitoring over part(s) of the EMMOZ, in combination with the dedicated MMO(s)

The recommended monitoring method for the EMMOZ would involve at least one MMO stationed from an elevated viewpoint over the entrance channel (approximately 800 m across) watching for any marine mammals entering or leaving the Harbour. Piling work would cease when an animal approached and / or passed through the entrance[2], depending on species. Activity would recommence once animals had moved out of the designated EMMOZ.

It is assumed that MMOs will be able to adequately distinguish baleen whale and leopard seals from the other species while monitoring the EMMOZ and activate the different shut-down zones accordingly. If this is not possible, the EMMOZ will serve as the shut-down distance for all species until the whale or leopard seal has not been sighted in the Whangārei area for at least 48 hrs.

[2] The best location would be an elevated tower or crane on Refining New Zealand's property near their jetty. MMOs are expected to continuously scan with the naked eye, binoculars or spotting scope for any signs (e.g., dorsal fin, footprint watermarks, splashes, blows) of marine mammal presence.

### 4.2.6 Standard operating procedures (SOP) for MMOZ

This section discusses several standard operation procedures (SOP) that must be undertaken by contractors during piling activities to protect against any noise effects. These include pre-start, soft start, normal operation, stand-by operation, shut-down procedures and post-piling observation.

The marine mammal observer (MMO) associated with the pile-driving works will be familiar with the SOP and will document the process. A record must be kept of all sightings, delayed start-up or enforced shut-downs due to presence of marine mammals. Details of any shut-down event should be captured on the Marine Mammal Sighting Form (see Appendix A).

#### *4.2.6.1 Pre-start procedure*

To minimise the risk to any species already present in the harbour (i.e., swimming into Harbour regions overnight prior to piling starting in the morning), a pre-start scan should be undertaken by at least two MMOs first thing in the morning (and after any extended breaks in piling greater than one hour) for at least 30 minutes prior to piling commencing. If any animal(s) are present in or near to the MMOZ prior to pile driving commencing, operations will be suspended until the animal(s) has relocated out of the MMOZ.

MMOs should focus on the Marine Mammal Observation Zone (MMOZ) but should also scan beyond the zone and up to a 1 km radius from the source, where visibility allows. Observations should be made from the piling rig or a better vantage point if possible (i.e., in the absence of a high vantage point, a large observation zone may require an additional vessel to provide a sufficient observation platform).

#### *4.2.6.2 Soft-start procedure*

If marine mammals have not been sighted within or are likely to enter the MMOZ during the pre-start procedure, the soft-start procedure may commence in which the piling impact energy is gradually increased over a 10-minute period.

The soft start procedure should also be used after long breaks of more than 30 minutes in piling activity when associated visual observations have ceased. Visual observations for marine mammals within the MMOZ should be maintained by the MMO(s) throughout soft starts. The soft-start procedure may alert marine mammals to the presence of the piling rig and enable animals to move away to distances where injury is unlikely. In some instances, such as pile testing which requires immediate full energy, soft starts will not be possible.

Testing situations will only occur in optimal visibility conditions (i.e., MMO can easily and confidently observe the MMOZ for the required period) when the designated MMO shall ensure that the exclusion zone has been closely monitored for 30 minutes and that no mammals have been present in that period.

#### *4.2.6.3 Normal operating procedure*

If marine mammals have not been sighted within or are not likely to enter the MMOZ during the soft-start procedure, piling may start at full impact energy. MMO(s) should continuously undertake visual observations during piling activities and shut-down periods. After breaks longer than 30 minutes in piling activity and visual observations, or if visual observations are hampered by poor visibility, the pre-start procedure should be used.

#### *4.2.6.4 Stand-by operating procedure*

If a marine mammal is sighted near the observation zone during the soft start or normal operating procedures, the operator of the piling rig should be placed on stand-by ready to shut-down the piling rig. The MMO(s) should continuously monitor the marine mammal in sight.

#### *4.2.6.5 Shut-down procedure*

If a marine mammal is sighted within or about to enter the shut-down zone, the piling activity should be stopped immediately. If a shut-down procedure occurred and marine mammals have been observed to move outside the observation zone, or 30 minutes have lapsed since the last marine mammal sighting, then piling activities should recommence using the soft-start procedure. If marine mammals are detected in the observation zone and poor visibility sets in, operations should switch to poor visibility procedures.

#### *4.2.6.6 Post-piling observations*

The MMO(s) should maintain a watch of the MMOZ (and beyond) for at least one hour after pile driving activity has ceased (or as long as daylight allows). Observers are looking for any indication of marine mammal presence in the wider vicinity to evaluate the duration of effect that piling activities might be having.

#### *4.2.6.7 Poor visibility procedure*

Poor visibility is defined as sea fog (on the water surface), winds greater than 20 kts and/or rain or sun glare that obstructs more than 50 percent of MMOZ. If these any of these conditions occurs to an extent that makes it too difficult for the MMO to visually inspect the MMOZ for marine mammals, then piling activities should be postponed until conditions improve. If the MMOZ is prone to strong sea chop or afternoon sea breezes (i.e., wind greater than 20 kts), and does not adversely affect piling operations, an additional MMO should be employed at a second observation location to ensure adequate coverage of the MMOZ.

If, during periods of poor visibility, there are more than three shut-downs due to marine mammals within the MMOZ, piling activities should be stopped for the remainder of the day.

### 4.2.7 Seasonal piling

If practical, the various piling stages of the project should be timed so that most of the piling work does not occur over successive seasons, e.g., back-to-back winters. (The use of the wider area is seasonal for some marine mammal species (e.g., baleen whales) and successive interactions of this type may affect an animal's decision to return to these waters in the near future.)

## 4.3 Control measures to minimise dredging effects

Dredging activity is expected to place intermittently and over short durations during a 6- to 12-month period. The lower-frequency, continuous noise generated by dredging activity is not expected to exceed PTS thresholds for any mammal and TTS is estimated to occur only when an animal is within one metre or less of the operating dredge, regardless of dredge type or location.

As the dredge spoil will be pumped from the dredge platform into the bunded area to form the reclamation (rather than transported and disposed of at another location), the risk of vessel strike of marine mammals from the dredge platform is nil to negligible. Therefore, the main risks are associated with the increase in underwater noise resulting in avoidance of noisy areas, behavioural changes, and auditory masking.

Because of the low to moderate risk rating and the potential for several noise-sensitive species to occur in the harbour area, the following control measures will be employed to manage the risks of dredging activities on marine mammals:

- Adoption of Best Practicable Option for noise emissions
- Verification of the *in-situ* noise levels produced from dredging activities
- Monitoring by trained Marine Mammal Observers (MMOs) and establishment of observation and shut-down zones. The MMO can be part of the crew.
- Establishment of central contact point with DOC and with local and regional marinas (discussed in Section 6)

### 4.3.1 Adoption of Best Practicable Option for noise emissions

Refer to Section 4.2.1 above.

### 4.3.2 Verification of the *in-situ* noise levels produced from dredging activities

Refer to Sections 4.2.2 and 4.2.3 above.

### 4.3.3 Establish a Marine Mammal Observation Zone

An exclusion zone will be determined for active dredge vessels, based on in situ noise measurement.

A MMO will be on watch whenever dredging activities are underway (including transiting) but will be most effective during daylight hours. If a marine mammal comes within the exclusion zone while a dredge vessel is undertaking

sediment extraction (and in-situ noise measurement showed elevated noise levels), noise controls shall be instigated to reduce the risk of TTS onset. The controls may include:

- Ceasing/reducing the pumping rate.
- Lifting the drag-head off the seafloor but continuing to pump.
- Ceasing dredging and lifting drag-head off the seafloor.
- Reduction in propulsion effort.
- Cessation of ongoing removal (if a backhoe dredge is in operation).

The on-board observer will communicate to the Dredge Master when a marine mammal is within the shut-down zone of the dredge vessel. The Dredge Master will then implement the control. Once the marine mammals have left the exclusion zone, the observer will advise the Dredge Master that normal operations can resume.

Details of any shut down event should be captured on an incident reporting form (see Appendix A).

## 4.4 Control measures to minimise other effects

Vessel strike, possible entanglement and habitat loss/prey disturbance have been identified as potential effects resulting from the Project. The risk of these effects is considered low will be managed by the control measures specified below.

### 4.4.1 Vessel strike

The dredged material will be used for reclamation (and will not be barged for disposal elsewhere), so the potential for any boat strike of local marine mammals from the dredge vessels is *nil to negligible*. However, there is some risk of vessel strike by associated vessels (used for transporting crew and MMOs) and while the risk is minimal, the following control measures will be employed to manage the risk of vessel strike:

- All project vessels to adopt best boating guidelines for marine mammals (see Appendix B). Encourage other port related vessels to also adopt these guidelines.
- Formally support a similar protocol to the Hauraki Gulf Transit Protocol for Commercial Shipping that includes speed limits, crew watches and reporting of sightings to reduce any chances of mortality from vessel strikes.
- Liaise with DOC on whale sightings in wider area.
- In the event of a known marine mammal strike or a fatal marine mammal incident, immediately notify DOC.

### 4.4.2 Possible entanglement

Marine debris from construction activities presents a possibility of entanglement for marine mammal species with whales, dolphins and pinnipeds often attracted to floating debris. Marine debris from coastal developments may include lost ropes, support buoys, bags and plastics. Loose thin lines and nets (including silt curtains) pose can pose an entanglement risk, especially when nets, ropes and lines are lost or discarded.

Construction-associated marine debris can be prevented in well-maintained coastal projects with proper waste management programmes. The possible entanglement risks posed by this project will be managed through the following controls:

- Waste management protocols outlined in the Project CEMP (e.g., secure onboard storage of lines, nets, and waste) to comply with the Maritime Protection Rules Part 180 (Dumping of Waste or Other Matter).
- Hanging silt curtains will be properly tensioned with plenty of spaces between the seabed and material for animals to manoeuvre under and around with few opportunities for entanglement.
- Fully enclosed standing silt curtains will be regularly inspected to check there are no openings for marine mammals to enter the contained area.

# 5 Monitoring and reporting

Monitoring and reporting measures will allow the Northport Project Manager and Contractor to adjust mitigation where necessary to manage any risk of impacts on marine mammals. Monitoring and reporting requirements are set out in the following sections.

## 5.1 Monitoring

Monitoring will be undertaken by the MMO's, Underwater Acoustics and Marine Mammal Monitoring Expert. Monitoring focuses on behaviour responses of marine mammals to piling and dredging operations using visual observations by the MMO(s) on the piling and dredging platforms (and/or any alternative observation platform/vessel) and passive acoustic detections of marine mammals' presence around the Harbour. Combining this monitoring data will determine marine mammal behavioural responses to the various pile driving activities and noise levels and enable mitigation to be improved, for example, a more effective sized MMOZ or better observation techniques.

### 5.1.1 Visual monitoring

Before, during and after pile driving operations, the MMO(s) must visually monitor the area around the pre-determined MMOZ from the piling activity as well as scanning the wider area of the Harbour. Each observer will have electronic or hard copies of the Marine Mammal Sighting Forms (Appendix A) with them at all times. When a marine mammal is sighted this will be reported on the sighting form sheets.

- What species of marine mammal is sighted?
- Date and time the marine mammal is sighted?
- At what stage of piling operations is the marine mammal sighted (e.g., pre-start, soft start, normal operation, stand-by operation, shut-down or post operations)?
- At what approximate distance is the marine mammal visible?
- Heading and distance from the vessel.
- Direction in which the animal is travelling.
- If the marine mammal is present while the pile driving operation changes, what is its reaction (e.g., does it immediately leave, does it leave and return, does it stay)?
- Short description of the animal(s) and their behaviour.
- Mitigation action taken, if any.
- Observer name and position.
- Photographs and video footage are recommended.
- Local weather conditions and sea state.

Marine mammal sightings will be logged and reported according to the form in Appendix A. Through its normal inspection and validation procedures, NPL will undertake periodic audits of the MMO performance, qualifications, and effectiveness. The NPL personnel undertaking the audit(s) will also have attended and passed a DOC approved MMO training course in accordance with the code of conduct developed by DOC.

### 5.1.2 Underwater acoustic monitoring

Passive underwater acoustic monitoring within the proposal area will occur before, during and after the reclamation works

NPL has collated underwater acoustic data on marine mammals within Whangārei Harbour since June 2020. Four SoundTraps are installed in bays within Whangārei Harbour to gather seasonal data on cetacean presence and frequency within the Harbour (see Figure 2). The goal of this programme is to establish a baseline of relative marine mammal occurrence within the harbour entrance area prior to any proposed development activities.

These SoundTraps will remain for the duration of the project and for as long as practical after the project is complete. The resulting data from the SoundTraps and temporary devices will be used (in conjunction with the visual

monitoring data) to verify the predicted visitation/presence of marine mammals to determine use of the project area by marine mammals during active piling operations and to determine the continued presence, or return, of marine mammals in the project area following the completion of pile driving activities.

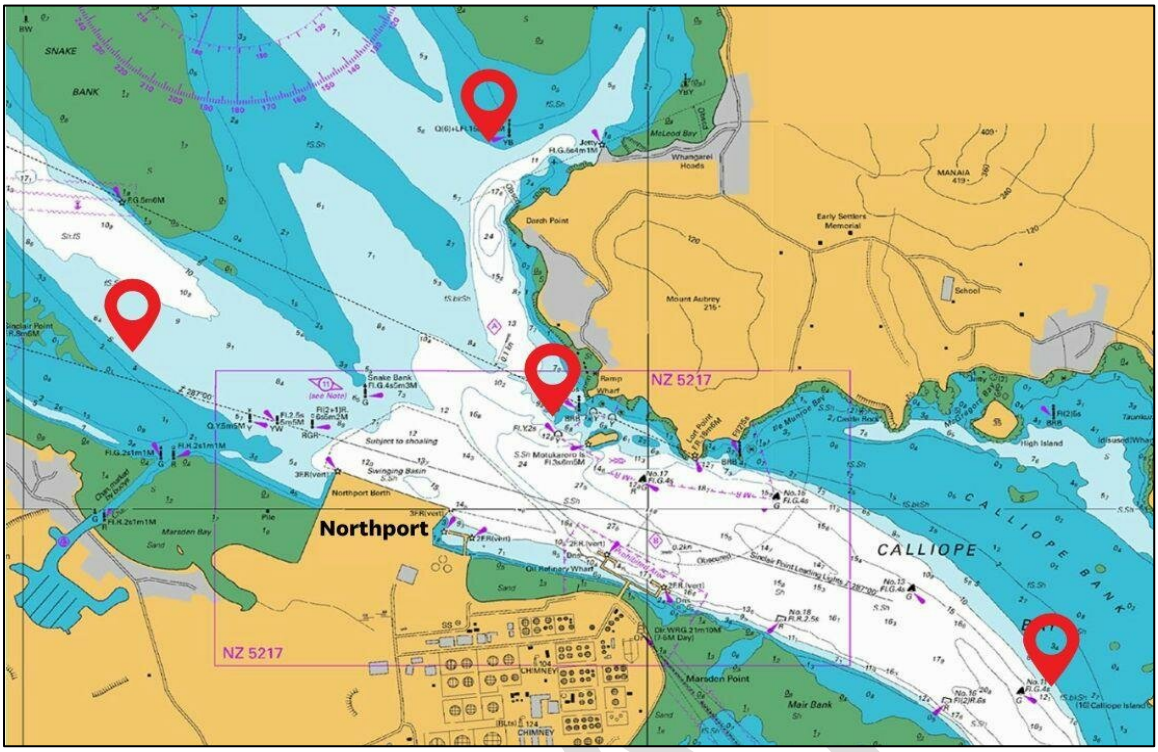



**Figure 2:** Red markers illustrate the deployment locations of the four underwater acoustic monitoring moorings for marine mammals in relation to the relevant bays within Whangārei Harbour.

# 6 Department of Conservation liaison procedures

A two-way liaison with the Department of Conservation shall be established for exchange of regional marine mammal sighting data throughout the project, (with a focus on nearby visiting baleen whales or leopard seal sightings).

With this information, the MMO can anticipate and verify the potential presence or absence of these, and any other species sighted in or near the proposal area. The MMO should also monitor news and social media for any information about marine mammals reported in the wider AOI regions. Any reports of baleen whales or leopard seal being present could potentially lead to additional MMO resources moving onto standby for deployment for the larger EMMOZ.

A similar contact should be established with Marsden Cove Marina staff, Westhaven Marina (in Auckland) and other nearby marinas (e.g., Tutukaka Marina) as well as LeopardSeals.org to receive sightings updates of the leopard seal, Owha, in the marina throughout the duration of the project. Due to leopard seals' aggressive nature, several precautions need to be considered if contractors have any staff working in or near the water when this animal may be present. In addition, the marine mammal observer can better anticipate the seal's possible movements near and through the project area and MMOZ/EMMOZ.

In addition, Northport shall collate and, on a quarterly basis, share any observer sighting data with DOC. Contact persons and contact details:

| Name | Organisation | Contact details |
|---|---|---|
| TBC | Department of Conservation | |
| TBC | Marsden Cove Marina | |
| TBC | Westhaven Marina | |
| TBC | Tutukaka Marina | |
| TBC | LeopardSeals.org | |
| | | |

# 7 Reporting

The following table sets out the reporting frequency.

**Table 5**: Written reporting requirements

| **Information** | **Timeframe** |
|---|---|
| Marine mammal observer watch and sighting forms must be provided to the NPL Project Manager | Weekly |
| Provide marine mammal observation sheets and any monitoring data to DOC | Quarterly |
| Noise verification data collated and reported to NPL Project Manager and DOC | Provide relevant reports to DOC within two weeks of providing to Northland Regional Council |
| Meetings between Project Manager and DOC staff to discuss monitoring results | Every six months during works and on completion of behavioural and noise monitoring report |
| All data Reclamation Completion Report | Within one year of completing the project |

# 8 References

4Sight Consulting 2021. Ecology and water quality report: Eastern development - Assessment of ecological and water quality effects (excluding marine mammals and birds). Prepared by 4Sight Consulting for Northport Ltd.

Baker CS, Boren L, Childerhouse S, Constantine R, van Helden A, Lundquist D, Rayment W, Rolfe JR 2019. Conservation status of New Zealand marine mammals, 2019. New Zealand Threat Classification Series 29. Department of Conservation, Wellington. 18 p.

Clement D 2021. Potential construction effects on marine mammals in the Whangārei Harbour region – Eastern Reclamation. Prepared for Northport Limited. Cawthron Report No. 3652. 54 p. plus appendices.

Pine M 2021. Assessment of underwater noise effects – percussive pile driving and capital dredging. Prepared for Northport Ltd. by Styles Group Underwater Acoustics. 65 p.

# 9 Applicability

Enviser Limited has prepared this report for Northport Limited in accordance with the agreed scope. No other party, aside from Northport Limited and other parties involved in delivering the project, may rely on this report, or any conclusions or opinions within it, for any purpose without the express written permission of Enviser Limited. This does not preclude the use of this report to inform the consenting of the project.

The opinions and conclusions within this report are based on the information that was viewed during preparation of the report.

Prepared by:

Authorised for Enviser Ltd by:

Jared Pettersson
Environmental Engineer
CPEng, MIPENZ, IntPE

# 10 Appendices

# Appendix A - Marine Mammal Sighting Forms

| **Date** | **Pile driver type/name** | **Pile number** | **Time at start of encounter** | **Time at end of encounter** |
|---|---|---|---|---|
| | | | | |

| **Observer name** | **Location / position** on land | **Water depth** (metres), **Beaufort, glare:** |
|---|---|---|
| | | |

| **Species** | **Bearing/angle to animal** (when first sighted) | **Distance to animal** (when first sighted) |
|---|---|---|
| | | |

| **Description** (include features: size, colour and pattern, shape and position of dorsal fin, direction and shape of blow) | **Total number** | **Number of adults** |
|---|---|---|
| | **Number of juveniles** | **Number of calves** |

| **Behaviour** (at start of sighting and any changes observed relative to changes in pile driving activity)<br><br>(Feeding, resting, travelling, socialising, breaching, bowriding etc – see reference sheets) | **Photograph taken**<br><br>**Y** **N**<br><br>**Direction of travel** (compass)<br><br>N S<br>NE SW<br>E W<br>SE NW<br>variable stationary |
|---|---|

| **Direction of travel** (relative to platform)<br>Towards<br>Away<br>Parallel (east or west direction)<br>Variable<br>Stationary<br>Other (explain) | **Piling activity at first animal detection**<br><br>Normal<br>Soft start<br>Pre-start<br>Post-observation<br>Stand-by<br>Shut-down | **Piling activity at last animal detection**<br><br>Normal<br>Soft start<br>Pre-start<br>Post-observation<br>Stand-by<br>Shut-down |
|---|---|---|

| **Time animals entered mitigation/exclusion zone** | **Action taken**<br><br>None required<br>Delayed start<br>Stand-by<br>Shut down | **Time animals left mitigation/exclusion zone** |
|---|---|---|
| | **Length of time mitigation employed** | |

# MARINE MAMMAL OBSERVER WATCH LOG

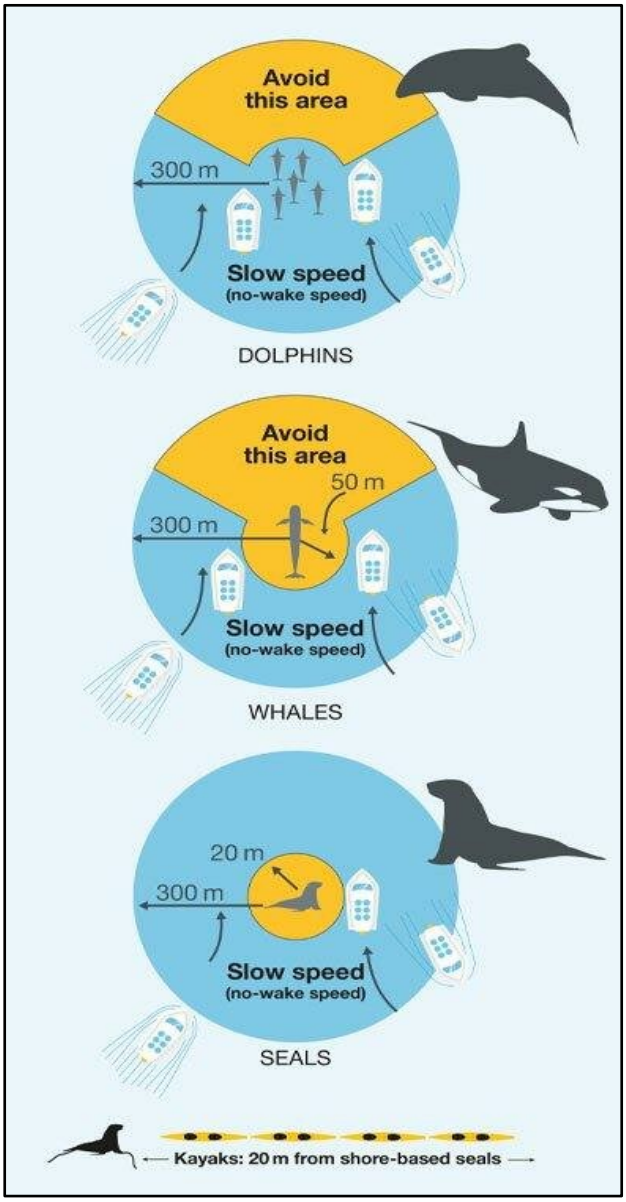
Observer name and location: ……
Observer watch start/end times: ……..
Piling start/end times……..

START A NEW LINE FOR EACH NEW START-UP OF PILE DRIVER.

RECORD FOR ALL WATCHES EVEN IF NO MARINE MAMMALS ARE SEEN

| Date / time | Pile number | Pre-start | | Soft Start | | Normal operation | | Post-observation | |
|---|---|---|---|---|---|---|---|---|---|
| | | Observer initial | Mammals sighted? | Observer initial | Mammals sighted? | Observer initial | Mammals sighted? | Observer initial | Mammals sighted? |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

# Appendix B - DOC guidelines for vessel interactions



# Appendix C - Species of interest

The following species are identified as being present within the Whangārei Harbour area and potentially influenced by the proposed construction activities:

- Bottlenose dolphin (*Tursiops truncatus*)
- Common dolphin (*Delphinus delphis*)
- Killer whale/orca (*Orcinus orca*)
- Bryde's whale (*Balaenoptera edeni bryde*)
- New Zealand fur seal (*Arctocephalus forsteri*)
- Leopard seal (*Hydrurga leptonyx*)
- Southern right whale (*Eubalaena australis*)
- Humpback whale (*Megaptera novaeangliae*)

A diverse range of marine mammal species live or pass through the North Island's upper and central east-coast waters, with sighting data collected over the last several decades recording sightings of at least 27 cetacean (whales, dolphins and porpoises) and two pinniped (seals and sea lions) species along the north-eastern coastline.

Clement (2021) notes the marine mammals most sighted near or within Whangārei Harbour are bottlenose and common dolphins, orca and Bryde's whales, with sightings occurring mainly during spring and early summer. Other species of interest include New Zealand fur seals, leopard seals, and southern right and humpback whales, which are all seasonal visitors to the wider Bream Bay area.

The bottlenose dolphin (Photograph 2.1) is listed as 'nationally endangered' by the New Zealand Threat Classification System (Baker et al. 2019) making them potentially more vulnerable to disturbance or changes within their distribution range (Clement 2021).

**Photograph 2.1:** Bottlenose dolphin (*Tursiops truncatus*) (Credit: Jason Pratt).

The common dolphin (Photograph 2.2) frequents north-eastern waters, year-round and is generally observed in deeper waters off the coast from Whangārei/Bream Bay, in a variety of group sizes (3–300 animals), with occasional inshore sightings (Clement 2021). This species is listed as 'not threatened' (Baker et al. 2019), however, little is known about their actual population sizes and movements between sighting locations.

**Photograph 2.2:** Common dolphin (*Delphinus delphis*) (Credit: Krista Hupman, NIWA).

Orca (Photograph 2.3) are frequently sighted year-round in north-eastern waters but more commonly in late winter/early spring. The orca that visit Northland waters appear to be generalist feeders, opportunistically foraging in harbours, estuaries and coastal areas on rays, fish and other marine mammal species (Clement 2021). Orca are currently listed as 'nationally critical' by the New Zealand Threat Classification System (Baker et al. 2019) based on their naturally low abundance.

**Photograph 2.3:** Killer whale/orca (*Orcinus orca*) (Credit: Nathan Pettigrew).

Bryde's whales (a member of the baleen whale family) (Photograph 2.4) are the most reported whale species in the wider Bream Bay area, particularly over late spring and summer months, passing through offshore waters as they travel between Bay of Islands and Hauraki Gulf 'hotspots' (DOC sighting database). Their tendency to remain offshore also means that this species is unlikely to move into a harbour or bay like some other whale species (for example, southern right or humpback whales).

**Photograph 2.4:** Bryde's whale (*Balaenoptera edeni bryde*) (Credit: Gabriela Tezanos-Pin).

New Zealand fur seal pups and adults (Photograph 2.5) are regularly sighted in the Hauraki Gulf region with frequent sightings around the Hen and Chickens Islands as well as the occasional visiting seal within the Whangārei region as this species appears to be expanding northward (DOC sighting database). New Zealand fur seals are considered non-migratory but are known to easily and repeatedly cover large distances to find food. Some adults will travel out to open waters over winter while younger animals remain in shallower continental shelf waters.

**Photograph 2.5:** New Zealand fur seal/kekeno (*Arctocephalus forsteri*) (Credit: Katherine Clements).

Leopard seals (Photograph 2.6), although mainly occurring around the Antarctic pack ice, are occasional visitors to New Zealand waters over the colder autumn and winter months. There are several reports of solitary animals observed within Whangārei Harbour as well as various haul-out sites and marinas between Auckland and Northland (Clement 2021). The number of reported sightings is likely biased high, with a very small number of individuals reported multiple times given the novelty of seeing this species and the active reporting programme underway. An individual leopard seal, Owha, has been sighted visiting Marsden Cove Marina mainly over the autumn months

between 2018-2020 (K. Hupman/LeopardSeals.org, unpublished data). Due to leopard seals' aggressive nature, precautions need to be taken when working in the water near this species.

**Photograph 2.6:** Leopard seal (*Hydrurga leptonyx*) (Credit: Brent Tandy).

Several baleen whale species migrate through Northland waters from early winter (May) to the late spring months (November). Humpbacks (Photograph 2.7) travel from May to August and southern right whales (Photograph 2.8) from July to September. Humpback whales pass by Whangārei/Bream Bay on both north and south migrations but are more prevalent and travel closer to shore on their south-bound return migration when travelling with calves (mainly from October to late December).

Southern right whales frequent inshore, shallow regions of Northland's coast during seasonal migration periods, particularly when travelling with newborn calves. Once present, they can remain in the Northland region for several days to weeks and are most often seen between August and November. Southern right whales are considered 'at risk – recovering' by the NZTCS (Baker et al. 2019).

**Photograph 2.7:** Humpback whale (*Megaptera novaeangliae*) (Credit: Kaikoura Ocean Research Institute)

**Photograph 2.8:** Southern right whale/tohorā (*Eubalaena australis*) (Credit: Derek Quinn/SNPA).

While the waters within the AOI periodically support threatened or endangered species, such as bottlenose dolphins, orca, Bryde's whales, and southern right whales, there is no evidence indicating that any of these species have home ranges restricted solely to Whangārei Harbour and nearby Bream Bay waters. Further to this, several whale species have known migration routes through the region. However, harbour waters are not considered part of any important migration corridors, as most animals generally pass further offshore (more than 5 km) with only a few individuals found near or within the harbour entrance each year. Hence, based on current knowledge, the proposal area is not considered ecologically more significant in terms of feeding, resting or breeding habitats for any marine mammal species relative to other regions along the north-eastern coastline (Clement 2021).

# Appendix D - Marine mammal observer (MMO) requirements

As many of the control measures are triggered by the sighting of a marine mammal, a key part of these measures is having a MMO on continuous watch throughout pile driving operations. All MMOs on the project will, at a minimum, have attended and passed a DOC approved MMO training course in accordance with the code of conduct[3] developed by the DOC.

The DOC approved MMO training course comprises two parts, an online component and a 3-4 day practical, these will cover:

1. Online component
    - NZ law and requirements of the code
    - The role of observers
    - NZ marine mammals
    - Marine Mammal Acoustics and underwater sound
    - General seismic operations
    - Visual observations
    - Navigation
    - Weather and Environmental conditions
    - Passive acoustic monitoring
    - Vessel health and safety
    - General observer issues

2. Practical component
    - MMO equipment
    - Navigation (compass use, bearings etc)
    - Calculating distance (reticule binoculars etc)
    - Plotting marine mammal detections and track logs
    - Marine Mammal identification
    - Detection procedures
    - Completing DOC reporting forms

A piling specific module, developed for Whangārei Harbour's special characteristics and the reclamation project, will supplement the above standard course material.

The observer(s) has two general duties:

1. To detect, record and report the presence of marine mammal within the wider operations area.
2. To enforce noise control measures, including documenting any action taken (if necessary).

[3] Code of Conduct for Minimising Acoustic Disturbance to Marine Mammals from Seismic Survey Operations