

Applicant: Coastal Resources Ltd

Site: Northern Disposal Area

Report Title: Marine Consent to
Dump Application and
Supporting Impact
Assessment

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Glossary

AEE	Assessment of Environmental Effects
AUPOP	Auckland Unitary Plan Operative in Part
CRL	Coastal Resources Ltd
DOAG	Disposal Options Advisory Group
DOC	Department of Conservation
EEZ	Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 201
EPA	Environmental Protection Authority
MBES	Multi Beam Echo Sounding
MNZ	Maritime New Zealand
MPI	Ministry for Primary Industries
NIWA	National Institute of Water and Atmospheric Research
NDA	Northern Disposal Area
NZDF	New Zealand Defence Force
POAL	Ports of Auckland Limited
RMA	Resource Management Act 1991
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UXO	Unexploded Ordnance

Executive Summary

In 2013 Coastal Resources Ltd (CRL) was granted a Dumping Permit from Maritime New Zealand (MNZ) for the disposal of 50,000 m³ per annum of dredged material at a new deep-sea spoil disposal site east of Great Barrier Island (now referred to as the “Northern Disposal Area” (NDA)) (a 1,500 m radius circle centred on 36° 12.3403"S and 175° 48.002 "E (WGS84 datum)).

This Permit has subsequently had a number of variations and owing to legislative changes is now administered by the Environmental Protection Authority (EPA). The current Marine Consent EEZ900012 expires on the 31st of December 2032. To date, over 400 trips to the NDA have been undertaken with approximately 199,800 m³ of dredged spoil disposed of (as at 1 April 2018). Disposal material has come from Pine Harbour Marina, Half Moon Bay Marina, Sandspit Marina, Hobsonville Marina, Whitianga Marina and Hobsonville Point.

The NDA site replaced the Auckland Explosives Dumping Ground (AEDG) site for the disposal of dredged spoil from within Auckland as it was considered at that time by Maritime New Zealand (MNZ) that the continued use of the AEDG site did not meet the requirements of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention) (which New Zealand had become a signatory to). No other practical alternative options for the disposal of dredged material were identified at that time or subsequently except for reclamation within the Ports of Auckland. With no further consented reclamation projects at the Ports of Auckland this option now no longer exists.

At the time of the original application a pre-cautionary approach was taken (as this was a new marine disposal site) and a low annual disposal volume was sought. In addition, as part of the original application a trial disposal was also undertaken so the activity could be monitored. No other marine disposal grounds have been consented to service the Auckland region since that time.

It is now apparent that the NDA will be the main site for the disposal of dredge spoil in the Auckland Region and possibly from some marinas in the Waikato Region. The maintenance dredging of most marinas in Auckland (which is likely to continue to be the main source of dredged spoil) will continue to be required and is becoming increasingly important for navigation, including the continuation of public ferry services which utilise a number of Auckland marinas.

CRL is therefore applying for a marine disposal consent to continue offshore disposal of dredged sediment at the NDA and increasing the annual disposal limit from 50,000 m³ to 250,000 m³ per annum. The existing consent will be surrendered upon the new consent being given effect to.

CRL engaged Beca to undertake a desktop assessment of the existing environment and the expected oceanographic effects of disposal of dredged sediment at the NDA. Bioresearches were engaged to undertake an assessment of sediment chemistry, suspended solids and ecology, based largely on the monitoring undertaken to date. Property Economics were commissioned to undertake the supporting Economic Assessment.

Site investigations, a pilot disposal and monitoring trial in 2010, and analysis of the NDA site were undertaken for the previous consent application. This work, together with an assessment of regular disposal monitoring undertaken between 2011 and 2016 and results of a review of international literature on deep-water disposal sites, has been used as the basis for Bioresearches and Beca Assessments.

The NDA was initially identified as a potentially suitable disposal site because:

- It is located within the EEZ boundary.
- It is located outside of the Hauraki Gulf Marine Park.
- It is located beyond the boundaries of a proposed Great Barrier Marine Reserve that was being considered at that time.
- It is located on the continental shelf (a topographically flat terrace).
- The seafloor sediment is mud to sandy/mud (similar to the material to be disposed).

- The water depth will decrease the likelihood of resuspension from currents on the seafloor caused wind and waves.
- There is the capacity to implement an effective monitoring programme.
- It is economically accessible from the Auckland and Coromandel areas.
- There are no nearby reefs or ecological zones of special significance.
- The ecosystem at the site is non-sensitive.
- There are no obvious sites of cultural significance.

No changes in circumstances have been identified which impact on this original assessment.

The material disposed of at the site to-date has predominantly been from marinas. After approval by MNZ and more recent times by EPA as a source site, sediment is generally loaded onto a bottom-dump barge from source by digger. The dredged sediment is then transported to the NDA via bottom-dump barges, either self-propelled or towed by tugs.

The tug/barge skipper is required to check for marine mammals for 30 minutes prior to disposal and record the date, time and GPS coordinates of both the start of the mammal monitoring and disposal. Unloading is then achieved by the opening of the barge floor (while the barge remains in motion over the disposal spot at a rate of 4-7 knots depending on weather conditions) and the disposal from the barge is achieved in 1-2 minutes. The barge is then closed and proceeds back to Auckland (a 20 to 24 hour round-trip).

To date, disposal has been at one location within the disposal area (ie the centre of the disposal area). It is proposed to maintain a 100 m target radius around a disposal point but vary over time the location of the disposal point within the disposal area after every approximately 250,000 m³ cumulative volumes to ensure that the material is dispersed more evenly within the disposal site.

Disposal of 250,000 m³ of dredged sediment per year equates to approximately 560 barge loads to the disposal site (as compared to the approximately 100-130 barge loads for 50,000 m³ per annum).

The short-term fate of dredged material immediately after disposal depends on the composition of the material and water depth at the disposal site. Studies have found that 95 to 99 percent of the material descends quickly through the water column at a constant rate. Once the material reaches the bottom the largest particles settle in a narrowly defined central mound, while finer components, such as silt, may spread over a larger area around the impact area, forming a layer of fluid mud. Field surveys undertaken at the NDA have indicated that the overall main component of the deposited material rapidly descends through the water column with a fall velocity of around 0.6 m/s.

The disposal mound is slowly developing and increasing in thickness over time. The survey data indicates that the present mound is elongated in the south-west to north-east direction over a length of around 460 m. There appear to be two peaks of material which may be attributed to the location of the barges during deposition and oval mound shape is likely to be the result of the direction of barge approach. The average mound side slope is between 1 in 75 and 1 in 50. A preliminary assessment of volumetric capacity at the disposal site indicates that the 1500 m radius site has potential to accommodate disposal at a rate of 250,000 m³ per annum for the 35-year application period.

After reviewing the available information there continues to be no evidence of deposited material beyond 375 m from the centre of the disposal site, well within the 1500 m radius boundary of the disposal site. This continues to support the original assessment of impacts, and the non-dispersive classification for the NDA.

Provided the method of disposal (including barge capacity), sediment type and environmental constraints remain constant the short-term plume effects associated with the disposal of dredged sediment will continue to be contained well within the disposal site. While the duration of elevated turbidity levels from the disposal plume are estimated to increase to some 1000 hours per year, this is considered a less than minor effect because of the low level of effects other than at the immediate point of disposal, and the relatively limited area (less than 0.2%) of north-eastern regional continental shelf affected overall.

Long term physical effects are predominantly associated with the continued growth of the disposal mound. The disposal mound is not anticipated to result in any significant adverse oceanographic impacts i.e. on waves and currents.

Based on the elutriation testing conducted pre-dredging contaminants are not likely to be released into the water column at the disposal site at concentrations high enough to cause adverse effects to biota.

The monitoring of the benthic biota at the disposal centre site has shown benthic fauna have been affected by the disposal operations, with significant mortality of individuals inhabiting the sediments, most likely as a result of smothering and insufficient time for recolonization between successive disposal events. Likewise, the individuals inhabiting the dredged sediments have not survived at the disposal site, most likely due to the change in depth and physical disturbance of dredging and then being buried in the barge of dredge material with limited water space if any.

The exact geographical extent of the high mortality is not known but is limited to less than 500 m from the disposal centre site as significant decreases in abundance of biota were not detected at the 500 m sites. Based on the information available from sea bed cores and bathometric studies, the footprint of the disposal mound is elongated west to east and located within approximately 375 m east and west of the disposal area centre and 250 m north and south.

The ongoing disposal at the NDA will result in a gradation of effects radiating away from the disposal point out to and beyond the influence of disposal material. The effects will depend on the frequency, thickness of deposits, the biota present and their abilities to survive burial by sediments. The effects will therefore be different for different species. The result for a stable disposal volume and frequency will be an equilibrium of limited species and numbers in the centre, with a changing species composition and abundance with distance from the centre, finally becoming no different from the background biota.

Given the nature of the activity and its location, no potential significant risk to fin fish, mammals or birds have been identified.

Likewise, no potential effects on recreation activities have been identified and there will be nil or negligible visual and landscape effects and effects on human health.

A Consultation Information Pack was sent to a range of parties who may have an interest in the area (including various iwi representatives). Representatives of Ngati Rehua Trust, Ngati Manuhiri Kaitiaki Charitable Trust, Ngaati Whanaunga Incorporated Society and Ngai Tai Ki Tamaki Trust requested further consultation, and this was subsequently undertaken along with consultation with the Ngati Wai Trust Board. Various recommendations have been made in this report to make information more available to interested iwi and to provide results from and receive feedback on the on-going monitoring.

The Ministry for Primary Industries provided some comments which have been addressed in the final assessments. Auckland Council was further consulted and a number of their questions have also been answered through this process.

A range of consent conditions have been proposed which largely reflect the existing consent conditions but modified as appropriate to reflect lessons learnt during the implementation of the current consent. The key change is that instead of a single disposal point within the disposal area, disposal will now occur over a grid-pattern to spread out the disposal mound and reducing mound height.

In our opinion, granting consent would not be contrary to the purpose of the Act (s10 of the EEZ). The on-going disposal of dredged material has a very localised adverse effect (which is contained within the disposal area) and does not impact on the sustainable management of the natural resources of the EEZ or the continental shelf.

Granting consent under S62 with the recommended conditions outlined in Section Nine of this report (and which can be imposed in terms of s63 of the EEZ) will ensure that the adverse effects on the environment from the discharge will be both localised and minimal.

1. Introduction

This section introduces and outlines the background to this Marine Dumping Consent Application to the Environmental Protection Authority (EPA) under s38 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ). This section also provides a description of the history of the existing Northern Disposal Area (NDA) and an outline of the format of this report.

1.1 Background

In 2013 Coastal Resources Ltd (CRL) was granted a Dumping Permit from Maritime New Zealand (MNZ) for the disposal of 50,000 m³ per annum of dredged material (from various Auckland marinas) at a new deep-sea spoil disposal site east of Great Barrier Island (now referred to as the "Northern Disposal Area" (NDA)). This consented volume has been varied for certain periods to provide for specific disposal projects, including for 127,000 m³ between November 2014 and November 2015 to provide for the disposal of capital dredging spoil from the Sandspit Marina (although the total volume disposed of from Sandspit Marina was slightly less than this).

This Permit has subsequently had a number of variations and owing to legislative changes is now administered by the Environmental Protection Authority (EPA). The current Marine Consent EEZ900012 is included in Appendix One and expires on the 31st of December 2032.

The NDA site has replaced the Auckland Explosives Dumping Ground (AEDG) site for the disposal of dredged marine sediments (spoil) from the Auckland Region. It was considered at the time of the original application by MNZ that the continued use of the AEDG site did not meet the requirements of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention) (which New Zealand is a signatory to). No change in circumstances have been identified which may now result in marine dumping of spoil at the AEDG being no longer contrary to the London Convention.

No other practical alternative options for the disposal of dredged material were identified at that time apart from limited disposal of marine sediment (in a mudcrete form) at the Ferguson Wharf reclamation at the Ports of Auckland.

To date, over 400 trips to the NDA have been undertaken with approximately 199,800 m³ of dredged spoil disposed (as at 1 April 2018) under the current permit. Disposal material has come from Pine Harbour Marina, Half Moon Bay Marina, Sandspit Marina, Hobsonville Marina, Whitianga Marina and Hobsonville Point.

At the time of the original application a pre-cautionary approach was taken (as this was a new marine disposal site) and a low annual disposal volume was sought. No other marine disposal grounds have been consented to service the Auckland region since that time.

It is now apparent that the NDA will be the main site for the disposal of dredge spoil from the Auckland Region including from a number of marinas and potentially the Ports of Auckland, and also possibly from marinas in the Waikato Region. Dredged material may also come from network utility projects within the coastal marine area. The maintenance dredging of most marinas in Auckland will continue to be required and is becoming increasingly important for navigation, including for the continuation of public ferry services which utilise a number of Auckland Marinas (Pine Harbour, Bayswater, Hobsonville for example).

CRL has reviewed the proposed future requirements for the disposal of dredged marine sediment of the Auckland Region in the foreseeable future and has decided to seek a replacement marine dumping consent for the NDA with an increased maximum annual disposal volume (250,000 m³). At the time the new consent is given effect to, the existing consent will be surrendered.

1.2 History of the NDA Site

The NDA was originally identified as a potential disposal area in about 2007 and was then subject to a range of investigations by the University of Waikato. The doctorate thesis "Sediment Dispersion at the New Auckland Marine Dumping Ground, Northeast New Zealand" (Flaim BK, 2012) was the outcome of

those investigations. The work undertaken for that thesis was the basis of the Environmental Impact Assessment (EIA) prepared in support of the original dumping permit application to Maritime New Zealand (MNZ) which was lodged in August 2008.

The NDA was initially identified as a potentially suitable disposal site because:

- It is located within the EEZ boundary.
- It is located outside of the Hauraki Gulf Marine Park.
- It is located beyond the boundaries of a proposed Great Barrier Marine Reserve that was being considered at that time.
- It is located on the continental shelf (a topographically flat terrace).
- The seafloor sediment is mud to sandy/mud (similar to the material to be disposed).
- The water depth will decrease the likelihood of resuspension from currents on the seafloor caused wind and waves.
- There is the capacity to implement an effective monitoring programme.
- It is economically accessible from the Auckland and Coromandel areas.
- There are no nearby reefs or ecological zones of special significance.
- The ecosystem at the site is non-sensitive.
- There were no obvious sites of cultural significance.

The original application was lodged in August 2008 with MNZ. After notification and during the subsequent preparation of the Cultural Impact Assessment by the Ngati Wai Trust Board and a round-table meeting between iwi representatives, CRL and MNZ on the 10th of August 2009 it was agreed that a trial disposal period (for up to 7000 m³) would be undertaken and monitored.

This trial was subsequently granted consent (December 2009) and progressed with 5,800 m³ of spoil being disposed of within what is now the NDA. The monitoring reports prepared by the University of Waikato for CRL were subsequently submitted to MNZ with MNZ then having them reviewed by NIWA which was completed in July 2011.

The Marine Dumping Permit was then issued by MNZ on the 2nd of December 2012. An appeal against a number of conditions was lodged by CRL which was subsequently settled in July 2013. The review by MNZ of the original application and the 2010 monitoring data was extensive, with the processing of the application taking close to five years (including the trial disposal period).

The NDA has been used since that time, although with the change to the governing legislation, the consenting authority is now the EPA rather than MNZ.

The EPA to date has undertaken two audits of the implementation of the consent conditions (2016 and 2017). The required monitoring at 10,000 m³, 50,000 m³, 100,000 m³, 150,000 m³ and 200,000 m³ of disposed volume has been undertaken. The monitoring report for the 200,000 m³ is to be submitted to the EPA shortly (or may have already been submitted at the time of acceptance of this application by the EPA).

1.3 The Proposed Activity

This application is for a marine dumping consent to dispose of up to 250,000 m³ per annum of capital and maintenance dredging spoil at the NDA for a 35-year period.

An application for a marine dumping consent to provide for this activity can be made under s38 of the EEZ. This is a discretionary activity.

The completed prescribed form (as required under **s38(2)(a)** of the EEZ) is included in Appendix Two.

1.4 Consultation

During the preparation of this Impact Statement, a range of potential stakeholders/interested parties were identified. An initial consultation letter was sent to those parties (which included various iwi representatives) and this consultation and feedback is addressed further in Section Ten of this Report.

1.5 The Applicant

Coastal Resources Ltd (CRL) is an Auckland based resource company specialising in obtaining resource consents for sand mining and spoil disposal. CRL also operates a barge (the TR Healy) and undertakes dredging and spoil disposal.

CRL as the current consent holder is responsible for managing the use of the NDA, monitoring and reporting. Disposal at the site is currently undertaken either by CRL or by Dredging New Zealand (under the consent held by CRL).

Any party that utilises the NDA under the current (or proposed) consent, works under CRL's agreement with CRL ensuring that conditions are complied with.

1.6 Background to Impact Assessment

The NDA was originally identified as a potential disposal area in about 2007 and was then subject to investigations by the University of Waikato. The doctorate thesis "Sediment Dispersion at the New Auckland Marine Dumping Ground, Northeast New Zealand" (Flaim BK, 2012) was the outcome of those investigations. The work undertaken for that thesis was the basis of the Environmental Impact Assessment (EIA) prepared in support of the original dumping permit application to MNZ which was lodged in August 2008.

The NDA has been monitored since 2010 (during a trial run of disposal at the NDA as outlined above) and then since 2013 after the granting of the current consent.

Therefore, there is an existing volume of background information and monitoring which forms the basis for the Northern Disposal Area – Physical Oceanography Assessment, Dredged Material Disposal Options and International Deep Water Disposal Sites Report (Beca, 2018) (Appendix Four) and Northern Disposal Area – Assessment of Source Material, Ecological and Sediment Quality Effects Assessment of Disposal (Bioresearches, 2018) (Appendix Five).

1.7 Report Format

Osbornehay has been commissioned by CRL to coordinate and prepare the Impact Assessment (IA) for this application. The IA includes the following specialist reports:

- Northern Disposal Area – Physical Oceanography Assessment, Dredged Material Disposal Options and International Deep Water Disposal Sites Report (Beca) (Appendix Four) ("the Beca Assessment");
- Assessment of Source Material, Ecological and Sediment Quality Effects Assessment of Disposal (Bioresearches) (Appendix Five) ("the Bioresearches Assessment"); and
- Economic Assessment of Deep Sea Dredging Disposal in Auckland (Property Economics) (Appendix Six) ("The Economic Assessment").

As requested by EPA, this report format largely follows the Environmental Impact Assessment Template outlined in the report "Preparation of Environmental Impact Assessments: General Guidelines for Offshore Mining and Drilling with Particular Reference to New Zealand" (NIWA, June 2017).

In order for this report to better address the Impact Statement requirements under s39 and those matters the Consent Authority is to consider under s59(2B) and (3) of the Act, the environmental assessment is undertaken in a single section (Section Seven) (Impact Assessment and Proposed Mitigation).

Section Nine outlines the recommended conditions. These are largely based on the existing consent with modifications to reflect changes to the activity and learnings from the implementation of the existing consent since 2012. Since the granting of the original permit, various modifications to the current consent conditions have been made to ensure they are clear, practical and enforceable for CLR, parties working under the consent conditions and the consenting authority (originally MNZ but now EPA).

2. Statutory Context of the Application

This section outlines the statutory framework under which a marine dumping consent is required. This section also addresses other marine management regimes and international agreements that require consideration.

2.1 Statutory Framework

Sea-disposal of waste beyond 12 nm in the Exclusive Economic Zone is administered by the Environmental Protection Authority (EPA) under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ). The Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 is also of relevance.

The EEZ is the primary piece of New Zealand legislation that seeks to manage the environmental impacts of activities being undertaken within New Zealand's EEZ and continental shelf. The purpose of the EEZ is set in s10(1) of the EEZ.

- (1) *The purpose of this Act is—*
- (a) *to promote the sustainable management of the natural resources of the exclusive economic zone and the continental shelf; and*
 - (b) *in relation to the exclusive economic zone, the continental shelf, and the waters above the continental shelf beyond the outer limits of the exclusive economic zone, to protect the environment from pollution by regulating or prohibiting the discharge of harmful substances and the dumping or incineration of waste or other matter.*

Sustainable management is then defined in s10(2) of the EEZ Act as:

...managing the use, development, and protection of natural resources in a way, or at a rate, that enables people to provide for their economic well-being

while—

- a) sustaining the potential of natural resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- b) safeguarding the life-supporting capacity of the environment; and*
- c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

S20G(3) of the EEZ provides for dumping at sea if authorised by a Marine Consent.

Subpart 2 of Part 2 of the EEZ sets out the provisions for marine consents. This proposal is defined as a discretionary activity under s36 of the EEZ as it is not within an “authorised location”.

Sections 38 and 39 of the EEZ set out the matters to be covered in the application including in this Impact Statement. The Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 also covers other specific matters to be addressed.

Section 59 of the EEZ covers those matters the consent authority are to consider when processing the application with s60 outlining those matters to be considered in deciding the extent of adverse effects on existing interests. Section 60 then sets out the basis for the consent authority to make a decision on an application while s61 outlines the basis and scope on which conditions can be set on any granted consent.

Where sections of this report address specific requirements of the EEZ, then the section of the EEZ is provided in bold (for example **s58(2)(a)**).

It is confirmed that as the current consent is not to expire shortly then the provisions of s74 do not apply.

This application is required to be publicly notified (as it is not specifically listed in the regulations as a non-notified activity).

Table One (below) outlines where the specific sections of the EEZ have been addressed in this report.

EEZ Section	Section Addressed in this Report	Comments
38(2)(a) (Prescribed form)	Appendix Two	
38(2)(B) (Describe the proposal)	3	
38(2)(c) (Impact assessment & requirements under regulations)	7 and 7.6	
39(1)(a) (Description on proposed activity)	3.5	
39(1)(b) (Description of the area)	3.6, 4, 5 and 6	<p>These sections draw on the detailed assessments in the Beca and Bioresearches Assessments (Appendices Four and Five respectively).</p> <p>The site plan is included in Appendix Three.</p>
39(1)(c) (Existing interests)	10.1	
39(1)(d) (Effects on environment and interests)	7.1	This section draws on the detailed assessments in the Bioresearches and Bea Assessments and the Economic Assessment (Appendix Six).
39(1)(e) (Effects on biological diversity)	7.1	This is addressed in detail in the Bioresearches Assessment
39(1)(f) (Effects on rare species)	7.1	This is addressed in in detail in the Bioresearches Assessment
39(1)(g) (Consultation undertaken and outcomes)	10.2 and 10.3	Appendix Ten includes the consultation communication and responses.
39(1)(h) (Written consents)		No written consents have been sought.
39(1)(i) (Alternatives)	3.10	<p>This is also addressed in the Bioresearches and Beca Assessments.</p> <p>The 2010 Assessment of Alternative Sites is provided in Appendix Seven.</p>
39(1)(j) (Measures taken to avoid, remedy or mitigate)	7.1, 8 and 9	
39(2)(b) (Effects on human health/re-use)	7.2	This is also addressed in the Bioresearches and Beca Assessments

59(2B)(a) (Effects on environment) (which then relates back to s59(2))	7.3	This is also addressed in the Biosearches and Beca Assessments.
59(2)(a, b, d, e) (Effects on environment)	7.3	
59(2)(h) (Other marine management regimes)	2.2	
59(2)(j) (Conditions)	9	
59(2)(k) (Other relevant regulations)	2.3	
59(2)(l) (Other applicable laws)	2.4	
59(2B)(b) (Effect on human health)	7.4	This is also addressed in the Biosearches assessment.
59(2B)(c) (Alternatives)	3.10 and 7.4	This is also addressed in the Biosearches and Beca Assessments.
59(2B)(d) (Opportunities for re-use etc)	3.10 and 7.4	
39(3) (Other matters)	7.5	
63 (Conditions)	9	

Table One: Summary of Where EEZ Clauses are Addressed

2.2 Other Marine Management Regimes

Section 59(2)(h) of the EEZ requires that the consent authority considers the nature and effect of other marine management regimes.

Section 7 of the EEZ lists the range of marine management regimes which require consideration.

Biosecurity Act 1993

Biosecurity risks of spoil to be disposed of at the site is assessed as part of the spoil characterisation prior to the approval of a source site. This is specifically addressed in the consent conditions.

Continental Shelf Act 1964

Not relevant (as the application is not for exploration or exploitation).

Crown Minerals Act 1991

Not relevant as the proposal is not for the mining or take of mineral resources.

Defence Act 1990

The site is within an extensive submarine exercise area. The New Zealand Defence Force (NZDF) is consulted prior to any disposal periods to seek confirmation that there are no operations in progress which may be affected by the dumping operation. It is intended that this consultation will continue and this is a recommended condition of consent. To date there has been a single time (November 2016) when a potential conflict of timing was identified by NZDF and the consent holder worked around the scheduled exercises in agreement with NZDF.

Fiordland (Te Moana o Atawhenua) Marine Management Act 2005

Not relevant.

Fisheries Act 1996

No fishing rights are affected by the proposal. No parties identified specific fishing right concerns during the consultation process and it is noted that no fishing representatives/interest groups responded to the consultation documentation.

Hauraki Gulf Marine Park Act 2000

Not relevant. The NDA is located outside the Hauraki Gulf Marine Park.

Kaikōura (Te Tai o Marokura) Marine Management Act 2014

Not relevant as the NDA is not located in this location.

Marine and Coastal Area (Takutai Moana) Act 2011

The NDA is outside the territorial sea (ie beyond 12 nautical miles from shore).

Marine Mammals Protection Act 1978

It is considered that the proposal is not contrary to nor in contravention of the Marine Mammals Protection Act 1978. As outlined in the Bioreserches Assessment (Appendix Five) there is negligible risk to mammals from the activity.

Marine Reserves Act 1971

Not relevant as the NDA is not within or located in close locality to any Marine Reserves.

Maritime Transport Act 1994

All vessels used for the disposal operation are regulated under the Maritime Transport Act 1994. The management and regulation of vessels using the disposal area does not require to be further regulated in terms of the consent.

Resource Management Act 1991

Not relevant as the NDA is outside that territorial area covered by this Act. There is no indication that spoil material is being transported into the territorial area covered by the Resource Management Act. For the same reason, the New Zealand Coastal Policy Statement 2010 does not require consideration.

Submarine Cables and Pipelines Protection Act 1996

Not relevant as there are no cables or pipelines within or close to the NDA.

Wildlife Act 1953

The Wildlife Act 1953 deals with the protection and control of wild animals and birds and the management of game. No specific wildlife which may be affected by the proposal has been identified in terms of requiring specific consideration under this Act.

In summary it is considered that the proposal will not be inconsistent with any of the relevant provisions in the 'other marine management regimes' identified.

2.3 Relevant International Agreements

Section **59(2)(k)** of the EEZ requires that the consent authority must take into account other relevant regulations (other than EEZ Policy Statements)

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (London Convention)

The objective of the London Convention is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. In 1996, the London Protocol to the London Convention was agreed to update the Convention and eventually replace it.

In New Zealand dumping standards within and outside 12 nm from land are derived from the 1996 London Protocol. Under the Protocol all dumping is prohibited except by permit or for limited specific wastes types.

The NDA was originally identified and then consented to replace the Auckland Explosives Dumping Ground (AEDG) site (for spoil disposal) as the AEDG site could not be monitored and it was considered that the use of it was in contravention of the London Convention.

It is considered that the use of the NDA for disposal of spoil is not in contravention of the London Convention and the granting of the current permit could not have proceeded if the proposal at that time was in contravention. There are no known reasons why the continued use of the NDA may now be in contravention of the London Convention.

It is considered that there are no other relevant regulations requiring specific consideration.

2.4 Other Laws

Under section **59(2)(l)** the consent authority is to consider any other applicable law (other than EEZ Policy Statements)

The operation of vessels to and from the disposal area in terms of the Health and Safety at Work Act 2015 will be the responsibility of the vessel operator.

All vessels used for the disposal operation are regulated under the Maritime Transport Act 1994.

There are no other relevant laws that require consideration in terms of this application.

3. Scope of Application and Project Description

This section outlines the application details, the location of the NDA and provides a summary of the value of investment to date in investigating, consenting and operating the NDA and the costs to date for the preparation of this new consent application. This section then outlines why the consent is being sought and a description of the disposal operation undertaken at the NDA and the site itself.

A description of the possible source sites for spoil to be disposed of is provided along with a description of the sediment characterisation testing undertaken before spoil is approved by the EPA for disposal at the NDA.

This section then assesses alternative options for the disposal of the spoil material.

3.1 Application Details

Consent Applicant/Holder:	Coastal Resources Limited (CRL), PO Box 8, Beachlands, Auckland 2147.
Purpose:	To authorise the disposal of up to 250,000 m ³ per annum at the NDA of accumulated sediment and capital dredging sediment by marine dumping.
Authorised Quantity:	The Consent Holder shall ensure that the maximum volume of sediment discharge shall not exceed 250,000 m ³ per annum for the duration of the Consent commencing (date to be set).
Date of Commencement:	This Consent shall commence on (date to be set at time of granting of the consent).
Duration:	The Consent shall expire on (date to be set, based on 35 years from the granting of the consent).
Method of Dumping:	Bottom Dump Barge.

At the time of the implementation of this consent, the existing marine dumping consent held by CRL will be surrendered. EPA will be advised in writing of the date which the new consent is being given effect to and therefore the date which the existing consent is being surrendered.

3.2 NDA Location

NDA Location: 1,500 m radius circle centred on 36° 12.3403"S and 175° 48.002 "E (WGS84 datum).

Appendix Three includes the site location plan which includes the proposed locations of the disposal points within the NDA.

3.3 Value of Investment to Date

The current approximate value of investment in the NDA by the applicant is as follows (excluding the cost of internal CRL staff):

- 1 Cost of original investigation and consenting costs for the current consent: \$650,000
- 2 Cost of monitoring to date of the NDA (as at January 2018): Approximately \$18,000 per 50,000m³ monitoring (excluding the operational costs of the monitoring boat and internal staff costs).
- 3 Cost to date of administering the current consent (including MNZ then EPA fees (as at January 2018)): \$156,000

3 Cost to date of investigations/assessment for this current application (as at 1 April 2018): \$200,000.

It is noted that the applicant has also invested \$2.8 million for the construction of their barge "TR Healy" which is one of the barges used for disposal at the NDA.

3.4 Why the Consent is Being Sought

As outlined in Section 2 of this report, a marine dumping consent is required under the EEZ for the disposal of spoil at the NDA.

Disposal of dredged material from the Auckland Region has been a historical requirement and is highly likely to continue into the future due to the effects of sedimentation occurring within marinas and ports in the Auckland Region. Section 2 of the Beca Assessment (Appendix Four) provides a summary of the historical context of the disposal of dredged material in Auckland.

Since the findings of the Disposal Options Action Group (DOAG) in 1993, the requirement for a new deep-sea disposal site in Auckland has been identified. The issue of dredging disposal in the Hauraki Gulf was also the subject of a report by the Parliamentary Commissioner for the Environment (Dredgings Disposal in the Hauraki Gulf – Final Report of the Technical Review Panel, April 1995).

In 2007, CRL in conjunction with the University of Waikato identified then investigated a possible new site (now known as the NDA) with CRL obtaining consent for marine dumping in the NDA in 2013. The use of the NDA has proven to be practical and CRL is now seeking a new permit to increase the maximum volume of spoil per annum that can be disposed of at the NDA to meet the predicted market requirements over the next thirty-five years.

3.5 Disposal Operation Description

The following is the description of the proposed activity required under **s39(1)(a)**.

The material disposed of at the site to-date has been from marinas and is marine sediment (and generally referred to in this report as spoil). After approval by EPA as a source site, sediment is generally loaded onto a bottom-dump barge from source by digger. A description of possible source sites and dredged material characterisation is given later in this section.

The dredged sediment is then transported to the NDA via bottom-dump barges, either self-propelled or towed by tugs (see Photograph One below). The barges used have varying capacities ranging from around 350 m³ to 700 m³ and averaging 500 m³.

The tug/barge skipper is required to check for marine mammals for 30 minutes prior to disposal and record the date, time and GPS coordinates of both the start of the mammal monitoring and disposal. Unloading is then achieved by the opening of the barge floor (while the barge remains in motion over the disposal spot at a rate of 4-7 knots depending on weather conditions) and the disposal of the spoil from the barge is achieved in 1-2 minutes. The barge is then closed and proceeds back to Auckland. A round-trip from Auckland to the NDA can take in the order of 20 – 24 hours.

To date, disposal has been at one location within the disposal area with this being the centre of the disposal area. It is proposed to maintain a 100 m target radius around a disposal point but vary over time the location of the disposal point within the disposal area after every 250,000 m³ ± 1,000 m³ cumulative volumes to ensure that the material is dispersed more evenly within the disposal site. Appendix Three includes a plan showing the proposed locations of disposal points within the NDA. This change in disposal location over time is the main change (apart from the increased volume) to the current disposal operation.

Disposal of 250,000 m³ of dredged sediment per year equates to approximately 560 barge loads to the disposal site (as opposed to the approximately 100-130 barge loads for 50,000 m³ per annum).

The short-term fate of dredged material immediately after disposal depends on the composition of the material and water depth at the disposal site. Previous studies have found that 95 to 99 percent of the material descends quickly through the water column at a constant rate. Once the material reaches the bottom the largest particles settle in a narrowly defined central mound, while finer components, such as silt, may spread over a larger area around the impact area, forming a layer of fluid mud. Field surveys

undertaken at the NDA have confirmed that the overall main component of the deposited material rapidly descends through the water column with a fall velocity of around 0.6 ms⁻¹.

In terms of the very small percentage of suspended material, field studies at the NDA indicates that turbidity arising from dispersed fines as only being significant within approximately 500-600 m of the disposal location.

This disposal process is further described in the Beca Assessment (Section 4.4, Appendix Four).

The following table sets out the volumes disposed of to date from the various sources. Apart from Sandspit and Hobsonville Point, which were capital dredging projects, all other spoil was from maintenance dredging of the respective marinas.

Year	Site	m ³
2013	Pine Harbour Marina	10,157
2013	Half Moon Bay Marina	6,000
2014	Pine Harbour Marina	4,800
2014	Sandspit	3,500
2015	Sandspit	102,595
2016	Sandspit	800
2016	Pine Harbour Marina	12,202
2016	Hobsonville Marina	9,744
2017	Hobsonville Marina	1,391
2017	Pine Harbour Marina	7,162
2017	Hobsonville Point	29,740
2017	Whitianga Marina	2,652
2018	Pine Harbour Marina	3,130
2018	Hobsonville Marina	5,927

Table Two: Disposal Volumes

Section 2.2 of the Bioresearches Assessment (Appendix Five) provides the sediment quality history of the material disposed of at the NDA to date.



Photograph One: A Tug and Barge Operation

3.6 Description of the NDA

The following is a general description of the subject site required under **s39(1)(b)** of the EEZ with a more detailed description then provided in Sections 4, 5 and 6 of this report and the Beca and Bioreserches Assessments (Appendixes Four and Five respectively). The Beca and Bioreserches Assessments include the outcomes of the monitoring undertaken since 2010 (including bathymetric surveys and seabed sediment cores).

The NDA lies approximately 25 km east of Great Barrier Island and 22 km north of Cuvier Island. It is located outside the 12 nm territorial seas limit and inside the boundaries of the Exclusive Economic Zone. A plan showing the location of the NDA is included in Appendix Three.

The NDA is a 1500 m radius circle centred on: 36° 12.3403'S and 175° 48.002'E (WGS84 datum). The water depth at the NDA ranges between 135 m and 140 m.

In summary:

- The NDA is located on the continental shelf at water depths of around 135-140 m. This location is generally a flat seabed with little to no distinguishable morphologic features. Contours run north-west to south-east with a gradient of approximately 2%. The continental shelf break occurs at the 200 m contour which is approximately 20-25 km east (seaward) of the NDA.
- Sediment types in the vicinity of the NDA are typically muddy/sand to sandy/mud with a calcium carbonate content of less than 50%.
- In general, the tidal characteristics at the NDA are generally similar to those of nearby regions. There is a local tidal pathway associated with the presence of Great Barrier Island and the Hauraki Gulf, although this is not considered likely to impact on the principal flow patterns.
- The influence of the tides in the region was found to be relatively small contributing approximately 25% of overall flow.

- Due to the predominant wind direction being from the south-west, the water depth and the width of the continental shelf it is unlikely that upwelling or downwelling will be a significant factor at this site.
- The suspended sediment levels in the upper 10 m of the water column are typically low.
- The gently sloping seabed and lack of visible bed features, such as ripples or waves, combined with the presence of fine surface sediments implies that little movement of bed sediments occurs. The shallow gradient suggests a stable seabed that is unlikely to be subject to slope failures or slips.
- The concentrations of all contaminants measured at the site are below the ANZECC ISQG's where available.
- There are no known recreational activities occurring in the location of the NDA.
- The disposal mound is slowly developing and increasing in thickness over time. The survey data appears to indicate that the present mound is elongated in the south-west to north-east direction over a length of around 460 m. There appear to be two peaks of material which may be attributed to the location of the barges during deposition and oval mound shape is likely to be the result of the direction of barge approach. The average mound side slope is between 1 in 75 and 1 in 50.
- Disposed sediment has been identified only within <375 m radius of the disposal centre.
- Within the disposal area the sea bed contains benthic biota that live within and on the surface of the sediment. A detailed assessment of benthic fauna is given in Section 3.5.1 of the Bioresearches Assessment (Appendix Five).
- Marine mammals, such as whales and dolphins, use the north-east region as part of a migratory path and/or feeding and nursery ground. Studies have shown that the presence of these mammals in the vicinity of the NDA is not common. To date during disposal activity one whale has been observed travelling south near the site (November 2007) and on one occasion the hydrophone recording undertaken prior to disposal picked up a marine mammal. During the post 100,000 m³ disposal survey, a small pod of approximately six common dolphins were observed within the disposal area.
- A lack of sea floor habitat conducive to feeding suggests that bottom feeding fin fish are unlikely to inhabit the muddy bottom at the NDA. Pelagic fish are expected to use this area on occasions and have been observed at times on the depth sounder.

3.7 Possible Sources of Spoil

Table Three outlines the estimated volumes of potential spoil that may need to be disposed of and is based on current industry knowledge and in some cases discussions with the owner/operators of the source sites.

The following figures are based on the assumption that:

- (i) No other marine dumping sites are consented (the applicant is aware that POAL are at the very early stages of investigating dumping at the AEDG site again but at that stage it is understood no decision has been made on whether a consent application to the EPA will be made);
- (ii) No land disposal or reclamation options become available (and this is addressed further later in this report).

The applicant has taken a conservative approach in estimating the volumes that may need to be disposed of. It is noted that although an annual disposal volume of 250,000 m³ is being sought, this is the maximum volume which can be disposed of in a single year and does not imply that this will be the volume disposed of every year. A more detailed assessment of likely future disposal volumes cannot be provided as the dredging volumes are generally related to the inflow of sediment into these areas which can vary from

User	Capital	Maintenance (and estimated frequency during life of consent)	TOTALS
Pine Harbour Marina	100,000 m ³	9,000 m ³ x 10	190,000 m ³
Hobsonville Marina		25,000 m ³ x 10	250,000 m ³
Sandspit Marina		20,000 m ³ x 3	60,000 m ³
Half Moon Bay Marina	40,000 m ³	20,000 m ³ x 1	60,000 m ³
Ports of Auckland		30,000 m ³ x 10	300,000 m ³
Hobsonville Marina		10,000 m ³ x 2	20,000 m ³
Bayswater Marina		20,000 m ³ x 2	40,000 m ³
Americas Cup 36	70,000 m ³		70,000 m ³
Whitianga Marina		3,000 m ³ x 5	15,000 m ³
Other Maintenance		500,000 m ³	500,000 m ³
Other Capital	1,000,000 m ³		1,000,000 m ³
TOTALS			2,505,000 m ³

Table Three: Potential Consent Users (Ten Year Outlook) (Estimates Only)

year to year (depending on a range of factors such as weather and the degree of land disturbance occurring in any upstream catchments).

The recently consented Kennedy Point Marina is shortly to be constructed at Waiheke Island. The future maintenance dredging requirements of this Marina are unknown at this stage.

Maintenance dredging at Bucklands Beach Yacht Club (BBYC) has not historically been required and is being undertaken for the first time in 2018. The need for this dredging appears to have resulted from changes to the Auckland Council stormwater system which discharges into the marina. Therefore there may also be an on-going maintenance dredging need now at the BBYC but the volume and frequency of this maintenance dredging cannot be estimated at this stage.

3.8 Dredged Material Characterisation of Spoil to be Disposed Off

For capital and maintenance dredging projects, once it has been determined that disposal at the NDA is the selected option, then the methodology for characterisation of dredge material as outlined in the "New Zealand Guidelines for Sea Disposal of Waste" (MSANZ 1999) is progressed. These guidelines require a detailed description or characterisation of the spoil to enable the EPA to approve of the disposal of the spoil at the NDA.

The characterisation of dredge material and its constituents must include:

- origin, total amount, form, and average composition
- properties: physical, chemical, biochemical and biological
- toxicity
- persistence: physical, chemical, and biological
- potential for accumulation and biotransformation in biological materials or sediments.

The guidelines outline a four level procedure for dredge material characterisation, which is consistent with international best practice. A level 1 investigation reviews the existing information on the dredge material. A level 2 investigation is concerned with the physical and chemical characterisation of the dredge material. Level 3 and 4 investigations require various toxicity and bioaccumulation testing. If the data collected at one level are insufficient to make a decision about the permissibility of dumping then the characterisation process will proceed to the next level.

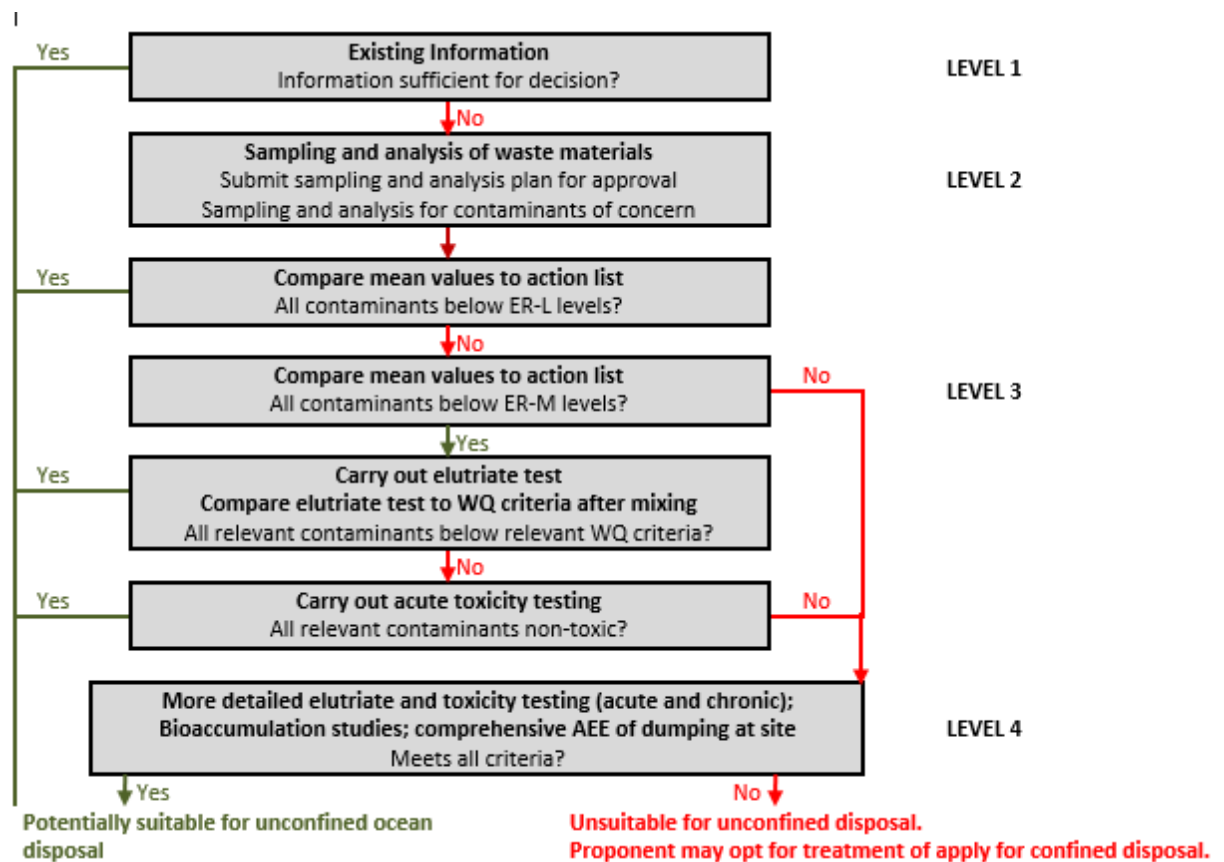


Figure One: The Dredge Material Characterisation Process (From the Bioresearches Assessment)

A detailed description of the characterisation process is provided in Section 2 of the Bioresearches Assessment (Appendix Five).

If the EPA has a concern with any contamination levels then it can refuse consent for the material to be disposed of at the NDA. Likewise, the Ministry for Primary Industries (MPI) can also recommend to the EPA that consent be refused for disposal if there are biosecurity concerns. To date, no requests for disposal at the NDA have been declined for contamination or biosecurity reasons. Several source sites have not progressed beyond the stage 1 assessment due to unacceptably high contaminant concentrations.

Between November 2012 and June 2017, spoil from six source sites has been characterised, dredged and disposed of at the OGD and this is addressed in detail in the Bioresearches Assessment (Section 2.2, Appendix Five). The characterisation of dredged material ensures that the dumping of this material does not assist in the spread of invasive, non-indigenous species or contaminated sediments to the dumping site and avoids unnecessary adverse effects on the resident biota.

No changes to the current characterisation requirements are proposed and it is confirmed that prior to the characterisation testing being undertaken for dredged material, the EPA approval of the characterisation methodology is required.

3.9 Economic and Operational Feasibility

The original investigation for a new deep-sea disposal site (to replace the AEDG) and then the subsequent consenting process involved an initial investment of \$650,000 by CRL. Since the granting of the consent in 2013, over 400 barge-loads of spoil has been disposed of at NDA. Monitoring and report costs along with MNZ then EPA fees to date have totalled in the order of \$210,000.

Currently, the full disposal volume of 50,000 m³ per annum is pre-booked for the next “disposal year” (starting November 2018) with back-up bookings likely to use part of this volume if the current disposal bookings do not proceed. The current November 2018 onwards bookings do not include any spoil disposal from the proposed new Americas Cup base, although the current resource consent applications for the Americas Cup base has indicated that dredged material can be disposed of at the NDA.

There are currently no viable alternative options in Auckland for the disposal of larger volumes of marine sediment and the applicant is unaware of any alternative options being investigated. The applicant remains of the opinion that demand for disposal at the NDA will continue and is likely to increase.

With over 400 barge loads to date being disposed of at the NDA, no operational issues with the use of the NDA have been identified. It is noted that for a number of marinas, dredging is tidal dependent and therefore the period which a barge can depart for (and arrive at) the NDA changes and needs to be flexible.

CRL considers that the on-going sustainable use of the NDA (and taking account of the new consent application investigation and consenting fees and future reasonable monitoring and EPA costs) is economic and would not have commenced this new consenting process if it was not economic or if there was not a proven long-term need for a deep sea disposal site to service Auckland.

The Economic Assessment of Deep Sea Dredging Disposal in Auckland (Appendix Six) states:

“The current level of operation (50,000 m³) has proven to be economically feasible given the level of costs outlined above. It is expected that the new consent will incur similar fixed costs and lower variable costs given the economies of scale that the increased quantum will allow. Given this, and the identified demand, the CRL operations at 250,000 m³ per annum will be economically feasible.” (Section 5.5)

3.10 Alternatives Considered

Under section **39(1)(i)** the Impact Assessment must specify any alternative locations for, or methods for undertaking the activity that may avoid, remedy or mitigate any adverse effects. Section **39(2)(b)(ii)** requires the Impact Assessment to specify any practical opportunities to reuse, recycle, or treat the waste or other material.

Disposal of dredged material from the Auckland Region has been a historical requirement and is highly likely to continue into the future due to the effects of sedimentation occurring within marinas and ports in the Auckland Region.

Section 2 of the Beca Assessment (Appendix Four) provides a summary of the historical context of the disposal of dredged material in Auckland. Since the findings of DOAG in 1993, the requirement for a new deep-sea disposal site in Auckland has been identified. In 2007, CRL in conjunction with the University of Waikato identified then investigated a possible new site (now known as the NDA) with CRL obtaining consent for marine dumping in the NDA in 2013.

DOAG identified a number of disposal/re-use options and these are summarised in Section 3.1.1 of the Beca Assessment (Appendix Four). Apart from reclamation and marine disposal in water deeper than 100 m, no other options were considered applicable. These other options were beach nourishment, habitat enhancement or creation, disposal to sanitary landfill, commercial and industrial applications, solid landfill, disposal to Lake Pupuke and forestry applications.

We are unaware of any reasons or changes of circumstances/technology why any of these options would now be applicable, practicable or consentable in Auckland and have therefore not considered them further. As a resource-based company, with sister companies involved in quarrying, industrial developments and land-development, a former interest in material recycling, the former developer and

owner of Pine Harbour Marina and with extensive networks within the New Zealand industrial scene, CRL has not identified since 2007 any practical opportunities for the reuse or recycling of dredged sediment (apart from in some cases the potential to use it as mudcrete within consented reclamations).

An assessment of alternative locations and operations was required to be provided as part of the application for the original dumping consents. In response to a request from MNZ during the processing of the application, a further detailed assessment of alternative options was provided. This assessment (Osbornehay letter, dated 23 July 2010) is included in Appendix Seven.

The following is an updated assessment based on that assessment and the assessments of historical disposal options provided in Section 1.1 of the Bioreserches Assessment (Appendix Five) and section 3.1 of the Beca Assessment (Appendix Four).

Option 1: Ferguson Wharf Reclamation

Description:

The current reclamation disposal site is the Ports of Auckland Fergusson Wharf reclamation (where marine sediment was used to form mudcrete (cement stabilised marine mud) for use in the reclamation). It was consented in the late 1990s and has provided for dredged material (from Ports of Auckland dredging) disposal over the past two decades.

The reclamation is now nearing completion and no longer has the capacity to accommodate dredged material from non-port parties. There are no further consented port reclamations in the Auckland-Waikato region. The port reclamation disposal is therefore no longer an available option.

Option 2: New Reclamation (sites not identified)

Description:

This option involves the use of the spoil (most likely as mudcrete) in a new reclamation.

Technical Limitations:

- There are no known currently planned and consented reclamations in Auckland which could utilise the spoil. The only exception to this is a minor reclamation at Westhaven Marina, which already has spoil assigned for use in it.
- The Auckland Unitary Plan Operative in Part strongly discourages new reclamations in Auckland unless certain policy requirements are achieved.
- It may take between three and five years to obtain resource consents for any new reclamations.
- The final reclamation would have a limited volume and may only provide a short-term solution until a new reclamation site would be required.
- It is noted that in the event a reclamation project did proceed in the Auckland Region then for economic reasons a party looking to dispose of marine sediment would consider its suitability for spoil disposal. It could be expected that if a party could dispose of their material at a new reclamation cheaper than at the NDA then they would pursue that option. However, this would only be a temporary solution until such time the reclamation was completed.

Option 3: Disposal to Landfill (as either waste or cover material)

Description:

Landfills (including Whitford Landfill) could accept spoil as either normal waste (ie waste to go into the landfill) or as cover material. Landfills need three different types of cover material, "daily" which is put on at night then taken away the next morning, "intermediate" for waste that is not going to be touched for a few months and "final" which is the final layer.

Cover material is needed to keep the gas and leachate in. The cover material must be dry, non-porous and stable enough to be track rolled with a bulldozer for compaction. Whitford Landfill for example used clay overburden sourced from local quarries and site developments for capping. This material does not require any drying or treatment.

For acceptance as either normal waste or cover material the dredged material would have to be de-watered and delivered to the landfill in a “spadable” form. For cover material it may also then need to be cement stabilised (but it is uncertain if it could be track rolled and therefore utilised as cover material).

Technical Limitations:

For delivery to a landfill in a “spadable” form the following will be required:

- The dredged spoil would need to be piped to shore (to an area adjoining where the dredging is occurring).
- The spoil would then need to be dewatered. This could be undertaken within a bunded area of approximately 1 ha (excluding any required sediment ponds) and would require a six-week period of no rain. The spoil would be spread 300 mm deep and left to dry for six weeks (weather dependant). For the majority of dredging sites in Auckland it is unlikely that there would be this adjoining area of land available for this. In addition a six-week period of no rain in Auckland cannot be guaranteed and seldom occurs.
- The bunded area and the discharge of the water from the de-watering process would require a range of resource consents. There are likely to be significant consenting issues for the discharge particularly if it is saline discharge into a freshwater environment (as would occur if the bund was located inland from the Marina). The discharge could not go into the local wastewater network. Any resource consent applications may face strong local opposition.
- If the bunded area was away from the dredging area then the spoil would need to be tankered to an off-site bunded area with the volume being tankered being approximately 5x the volume of spoil (owing to the salt water content). For lets say 3000 m³ of spoil this would result in about 1500 truck movements (using 10 m³ sealed trucks). This number of movements along the local roading network (and also then movements from the bunded area to the landfill) is likely to face strong public opposition and also potential opposition from Auckland Transport.

It is recognised that it would be practical for small volumes of non-spadable dredged sediment material could be taken by a landfill to dry at a later date. Likewise the disposal of contaminated sediment not suitable for disposal at the NDA may in some circumstances need to be disposed of in a registered landfill.

Option 4: Disposal at Any Current Near-Shore Sites

Description:

There are currently no near-shore disposal sites consented by Auckland Council. A new site would need to be identified and consented. The last application for a near shore site by Pine Harbour Marina Ltd in 2007 (the continuation of the use of an existing disposal site for spoil disposal) was declined by Auckland Regional Council. The continual opposition to near shore disposal by the then Auckland Regional Council was one of the key drivers in identifying and consenting the NDA.

Technical Limitations:

- 1 A new resource consent will be required for a new site (and detailed site investigations will be required prior to the lodgement of any resource consent applications).
- 2 Any resource consent application is likely to result in strong localised public opposition and also political opposition.
- 3 Our initial opinion is that regardless of the scientific evidence in support of any such application there is a considerable risk that any resource consent application will be declined in the first instance.

Option 5: The Auckland Explosives Dumping Ground (AEDG)

Description:

This is the former site for disposal of spoil from Auckland dredging operations. The NDA has replaced this AEDG for spoil disposal and it is understood that EPA has not granted any marine dumping permits in recent times for spoil disposal at the AEDG.

The AEDG is located in water depths ranging from 500 m to 1300 m and is centred approximately 50 km east of Cuvier Island. It was historically used by the Royal New Zealand Navy to dispose of unexploded ordnance (UXO), as well as being used for disposal of dredged material during the 1990s. Following the London Convention and the 1996 protocol, a call was made for environmental monitoring of established dredged material disposal sites. Monitoring could not be safely and economically undertaken at this site.

It is recognised that POAL is at the early stages of investigating using the AEDG again but it is understood that no decision has been made by POAL on whether they will lodge a consent application to utilise the AEDG.

Technical Limitations:

- 1 The site has not been cleared for unexploded ordnance (UXO) and therefore there are unacceptable risks to CRL or any other parties involved in monitoring.
- 2 Extreme water depths made accurate site monitoring either practically unfeasible or uneconomic in terms of bathymetric surveys, sediment coring and benthic surveys (which are required to determine if the dumping mound is mobile and the spatial extent of the mound and therefore the effects on the environment).
- 3 UXO detonation would be expected to result in mortality of fish and benthic biota and would also have potential impacts on marine mammals.

Appendix Seven includes a letter from Maritime New Zealand (dated 30 April 2010) which in part summarises their concern at that time with the AEDG site

4. Description of the Existing Physio-Chemical Environment

This section is a further description of the existing physio-chemical environment of the site (as required under s39(1)(b)).

The NDA lies approximately 25 km east of Great Barrier Island and 22 km north of Cuvier Island. It is a 1500 m radius circle centred on: 36° 12.3403'S and 175° 48.002'E (WGS84 datum).

The Beca Assessment (Section 5, Appendix Four) and the Bioresearches Assessment (Section 3, Appendix Five) provide a detailed site description. This includes outcomes of the monitoring (including bathymetric surveys and seabed sediment cores) undertaken since 2010. In summary:

- The NDA is located on the continental shelf at water depths of around 135-140 m. This location is generally a flat seabed with little to no distinguishable morphologic features. Contours run north-west to south-east with a gradient of approximately 2%. The continental shelf break occurs at the 200 m contour which is approximately 20-25 km east (seaward) of the disposal site.
- Sediment types in the vicinity of the NDA are typically muddy/sand to sandy/mud with a calcium carbonate content of less than 50%. The surface and upper layer (<20 cm) of the native bed sediment was found to be relatively soft and poorly consolidated but increased in density with depth.
- Field studies and analysis have found that in general, the tidal characteristics at the NDA are generally similar to those of nearby regions. Contrary to the norm though, the M2 tide propagates clockwise which implies that there is a local tidal pathway associated with the presence of Great Barrier Island and the Hauraki Gulf, although this is not considered likely to impact on the principal flow patterns.
- The influence of the tides in the region was found to be relatively small contributing approximately 25% of overall flow.
- Due to the predominant wind direction being from the south-west, the water depth and the width of the continental shelf it is unlikely that upwelling or downwelling will be a significant factor at this site.
- The suspended sediment levels in the upper 10 m of the water column are typically low.
- The gently sloping seabed and lack of visible bed features, such as ripples or waves, combined with the presence of fine surface sediments implies that little movement of bed sediments occurs. The shallow gradient suggests a stable seabed that is unlikely to be subject to slope failures or slips.
- The concentrations of all contaminants measured at the site are below the ANZECC ISQG's where available. The presence of previously disposed sediments is reflected in the concentrations of arsenic, copper, lead, mercury and zinc which are elevated at the disposal centre site in comparison with the other disposal area sites and control sites, while concentrations of dry matter, cadmium, chromium and nickel were similar or lower. No total petroleum hydrocarbons have been detected within or around the disposal area.
- The disposal mound is slowly developing and increasing in thickness over time. The survey data indicates that the present mound is elongated in the south-west to north-east direction over a length of around 460 m. There appear to be two peaks of material which may be attributed to the location of the barges during deposition and oval mound shape is likely to be the result of the direction of barge approach. The average mound side slope is between 1 in 75 and 1 in 50.

5. Description of the Existing Biological Environment

This section is a further description of the existing biological environment of the site (as required under s39(1)(b)).

A detailed description of the composition and activity (covering benthic fauna, mammals and fin fish) is provided in Section 3.5 of the Bioresearches Assessment (Appendix Five). In summary:

- The NDA is typical of large areas of the continental shelf in the region of New Zealand. Studies to date have shown that the disposal area does not contain any known vulnerable ecosystems or habitats of threatened species.
- Within the disposal area the sea bed contains benthic biota which are short-lived invertebrates that live in the sediment and in this location generally range in size from less than 1 mm to 200 mm long. A detailed assessment of benthic fauna is given in Section 3.5.1 of the Bioresearches Assessment. Section 3.5.1.3 of the Bioresearches Assessment outlines the changes to the benthic biota which has occurred over time since the commencement of disposal at the NDA.
- Marine mammals, such as whales and dolphins, use the north-east region of New Zealand as part of a migratory path and/or feeding and nursery ground. Studies have shown that the presence of these mammals in the vicinity of the NDA is not common and to date one whale has been observed travelling south near the site (November 2007) and on one occasion the hydrophone recording undertaken prior to disposal picked up a marine mammal. During the post 100,000 m³ disposal survey, a small pod of approximately six common dolphins were observed within the disposal area.
- A lack of sea floor habitat conducive to feeding suggests that bottom feeding fin fish are unlikely to inhabit the muddy bottom at the NDA. Pelagic fish are expected to use this area on occasions and have been observed at times on the depth sounder.
- On the continental shelf in this region it has been reported that Scleractinia (solitary stony coral) may be present. Scleractinia corals are typically found in water depths greater than 200 m, often associated more with elevated features such as seamounts or ridges. Despite this a few species have habitat ranges that could occur in the NDA. The Stoney corals *Caryophyllia quadragenaria*, *Kionotrochus suteri* and *Monomyces rubrum* have been recorded north of the NDA in depths similar to the NDA (Brook, 1982, Sivaguru *et al*, 2004, Lee *et al*, 2015). Scleractinia either alive or dead have not been recorded in the study area as part of either the predisposal studies or the post disposal monitoring studies.

6. Description of the Existing Socio-Economic Environment

This section is a further description of the existing socio-economic environment of the site (as required under s39(1)(b)).

A general description of the NDA is provided in Section Four of this Report. In terms of the existing socio-economic environment it is noted:

- The NDA is situated approximately 25 km east of Great Barrier Island and 22 km north of Cuvier Island. Both Islands are visible on the horizon on a clear day from the NDA but boats within the NDA would not be visible from the Islands.
- There are no obvious sites of cultural significance and none were identified during iwi consultation as part of the original application or through the notification/permit processing processes.
- The site is not within any recognised shipping lanes.
- The site is located outside the Hauraki Gulf Marine Park or any other type of reserve.
- There are no known recreational activities occurring in the location of the NDA. Owing to its distance from land, the site is unlikely to be commonly used for recreational fishing and no recreational (or commercial) fishing vessels have been identified in or near the site during both survey and barge trips to the site.
- No other economic uses within the NDA have been identified.
- The general area is used on occasions by the New Zealand Royal Navy. The NZDF is advised by CRL prior to the use of the NDA for disposal. To date, there has been one potential conflict of timing identified which was worked around with the agreement of the NZDF.

7. Impact Assessment and Proposed Mitigation

The following Impact Assessment follows the information requirements of **s39** (Impact Assessment) and those matters requiring consideration by the EPA under **s59(2B) and (3)** (Marine consent authority's consideration of application).

It is considered that in terms of **s39(3)**:

- (a) The detail provided in this Impact Assessment and the application as a whole is to the appropriate level of detail which corresponds to the scale and significance of effects that the activity may have on the environment and existing interests; and
- (b) There is sufficient detail provided to enable the EPA and persons whose existing interests are or may be affected to understand the nature of the activity and its effects on the environment and existing interests. In particular, the proposal is a continuation of an existing activity (although at a greater per annum volume) which has been subject to a range of investigations and monitoring since 2007 (including monitoring since 2013 required under the current consent conditions).

In respect to **s39(5)**, it is recognised that those measures that must be specified under **s39(i)(j)** (which is addressed below), include any measures required by another marine management regime and any measures required by or under the Health and Safety at Work Act 2015 that may have the effect of avoiding, remedying or mitigating the adverse effects of the activity on the environment or existing interests.

7.1 Information Required under **S39(1)(a)-(j)**

1(a) Describe the activity for which consent is sought.

A description of the activity (disposal of up to 250,000 m³ per year of capital and maintenance dredging spoil at the NDA for a 35-year period) is provided in Section Three of this report.

1(b) Describe the current state of the area where it is proposed that the activity will be undertaken and the environment surrounding the area.

A description of the NDA is provided in Sections Four, Five and Six of this report.

1(c) Identify persons whose existing interests are likely to be adversely affected by the activity.

This is addressed in Section Ten of this Report.

1(d) Identify the effects of the activity on the environment and existing interests (including cumulative effects and the effects that may occur in New Zealand or in the sea above or beyond the continental shelf beyond the outer limits of the exclusive economic zone).

A detailed assessment of specific potential effects is undertaken in both the Beca and Bioreserches and Assessments (Appendix Four and Five respectively). An Economic Assessment by Property Economics is included in Appendix Six.

Site Capacity

The ability for the NDA to accommodate the additional spoil has been addressed in Section 6.2 of the Beca Assessment. This assessment states:

"It is anticipated that there should be sufficient volumetric capacity within the overall NDA (1500m radius) to accommodate material being deposited at a rate of 250,000m³ per annum for 35 years, provided the ultimate disposal mound side slope remains steeper than approximately 1:400. Notwithstanding this, due to the potential variability in side slopes, ongoing monitoring should be used to regularly review the extent of the mound.

Due to the available water depth the maximum height of the disposal mound is not considered critical. A clear water depth of at least 120m would remain even with a 15m high mound. Calculations indicate that a 1 in 10,000 year Average Recurrence Interval wave height of 11.6m would induce a near-bed velocity of approximately 0.21m/s at 120m water depth (refer to Appendix B). This is at the lower end of the threshold to entrain deposited dredged material. Under ambient wave conditions (i.e. 1-1.5m average significant wave height, as described in Section 5.4.4) there would be no wave-induced sediment movement as near-bed orbital velocities would be around 0.03m/s, well below the entrainment threshold (refer to Appendix B)."

The need for on-going monitoring as recommended by Beca is accepted and is addressed further in Section Eight of this report and then the recommended conditions in Section Nine.

Beca in Section 6.3 of their Assessment have also calculated the estimated volumetric capacity of the NDA which is outlined in the following table:

Slope Angle	Maximum Height (m)	Maximum Volume (m ³)	Capacity (Years)
1:100 (circular cone)	15.0	35,300,000	141
1:300 (circular cone)	5.0	11,800,000	46
1:400 (circular cone)	3.75	8,800,000	Approx. 35
1:500 (circular cone)	3.0	7,100,000	28

Table Four: Estimate Volumetric Capacity of the NDA.

With the current average side slopes of approximately 1:100, the top row is the current estimation for the capacity for the NDA (and based on the disposal over the proposed grid). This estimation includes the spoil volume already disposed of at the NDA.

Water Quality – Turbidity Effects

Dredged material disposal can result in increased levels of turbidity (total suspended solids) during the actual disposal process (disposal plume) and over time through resuspension of the settled material. The potential water quality – turbidity effects have therefore been addressed in Section 6.1 of the Beca Assessment (Appendix Four).

In terms of the disposal plume, the Beca Assessment (Section 6.1.1) concludes:

"With the increased annual disposal quantity, the number of disposal events will increase. Increased turbidity and suspended sediment levels will occur more frequently than at present as the average bargeload is expected to remain the same (500m³). Based on previous monitoring (refer above), the disposal plume takes some 1-2 hours to disperse. On this basis, the overall duration of elevated turbidity / suspended sediment levels will increase from some 200 hours per year to some 1000 hours per year.

Taking into account that the previous monitoring concluded that effects within the water column were no more than minor and the limited area affected (the entire NDA site comprises less than 0.2% of the regional north eastern continental shelf extent between Red Mercury Island and Needles Pt off Great Barrier Island), this is assessed as a less than minor effect."

In terms of re-suspension/erosion of the disposal mound, the Beca Assessment (Section 6.1.2) concludes:

"In the case of the NDA, and as is typical for deep-water disposal sites, ambient near-bed currents are generally weak (e.g. 0.14m/s for the 1 in 10,000 year Average Recurrence Interval Significant wave height) and therefore resuspension of deposited material is expected to be uncommon (Eggleton & Thomas, 2004; Langtry et al., 2009; Scott & Redmond, 1989, cited in (Flaim, 2012))."

As mentioned in Section 5.3, observations of silt on boulders in the vicinity of the NDA also support this and indicate that the seafloor is not subject to water movements strong enough to re-suspend sediment (Maritime New Zealand, 2009).

Due to the significant water depth and low bed current velocities it is not anticipated that increasing the annual volume of deposited material will have a significant effect on the potential for the resuspension of deposited material.”

Contaminant Leaching

Leaching is the process of releasing contaminants in the sediments to the surrounding water. An assessment of potential contaminant leaching from the disposed sediment has been undertaken in Section 4.1 of the Bioresearches Assessment (Appendix Five).

As outlined in Section 2.1 of the Bioresearches Assessment dredge sediments are screened based on total sediment quality for EPA approval to be disposed of at the NDA. If contaminant concentrations exceed the guideline values then additional testing in the form of elutriate testing is conducted. The elutriate test simulates the release of contaminants from waste during and after disposal. Release can occur by physical processes (e.g. directly from sediment pore water) or by a variety of chemical changes (e.g. the oxidation of metal sulphides and the release of contaminants adsorbed to particles or organic matter). EPA can refuse permission for the dredged sediment to be disposed of at the NDA if there is a concern about the contaminant concentrations within it. This process is proposed to be continued and this is addressed in Section Eight of this report and is further addressed in the recommended conditions included in Section Nine.

On this basis, the Bioresearches Assessment concludes (Section 4.1):

“Based on the elutriation testing conducted pre dredging contaminants are not likely to be released into the water column at the disposal site at concentrations high enough to cause adverse effects to biota.

Following disposal and deposition on the seafloor, dredged materials that are contaminated or even slightly contaminated with various heavy metals, pesticides, polychlorinated biphenyls, and petroleum hydrocarbons, could still leach contaminants from the spoil mound if conditions change. Normally, significant leaching requires a pore water pressure (a pressure gradient from the spoil mound to the overlying surface water). Typically, a distinctive pressure gradient is only established when the mound is very large and solid. To date, at the Northern Disposal Area, only a low mound of sediment has result from the deposition of the dredged material, so that pore water pressure and, therefore, leaching of heavy metals into the overlying water column, will be minimal. The continued use of the site as a disposal area as proposed will not result in a significantly higher mound. Accordingly, we do not expect a high pore water pressure to induce leaching on the sea floor.”

Movement of the Disposal Mound

The potential movement of the disposal mound is addressed in Section 6.3 of the Beca Assessment (Appendix Four). This Assessment states:

“As outlined in Section 6.1.2, due to the cohesive nature of the material being deposited and the relatively low bed current velocities it is unlikely that deposited material will become re-suspended and mobilised after placement. This is further supported by and both the pre-disposal research (Flaim & Healy, 2008) and the post-disposal monitoring undertaken to date at the NDA, (Flaim & de Lange, 2011; Bioresearches, 2017). In particular:

- *The flat seabed (2% slope, refer Section 5.2) means that migration of material downslope is unlikely.*
- *The pre-disposal and initial post-disposal work concluded that the site was non-dispersive, and this continues to be supported by recent monitoring.*
- *NDA monitoring over 7 years of the 150,000m³ of sediment placed to date has not detected disposal sediment further than 250m from the centre of the disposal site (Flaim & de Lange, 2011; Bioresearches, 2017).*

These findings are consistent with observations made at numerous international sites (T. J. Fredette, 2004; USEPA, 2016), which indicates that deposited sediment, once on the seabed at a deep-water disposal site, does not spread far from its point of disposal.

Seismic activity at the NDA is expected to be relatively low and similar to the Auckland and Northland regions. Given the very gentle slopes (between 1 and 75 and 1 and 150) of the disposal mound it is not anticipated that a seismic event in this area will have any measurable effects.

It is therefore not anticipated that the non-dispersive nature of the NDA will be altered by increasing the annual volume of deposited material. Ongoing monitoring should continue to be used to confirm that material deposited remains within the disposal site boundaries. This approach is in accordance with international monitoring practice.”

Hydrodynamic Processes

Hydrodynamic processes have been addressed in Section 6.4 of the Beca Assessment (Appendix Four). The Assessment states:

“Due to the significant water depth, relatively low mounding heights and shallow side slopes the anticipated effects on hydrodynamic processes at the NDA are considered to be negligible.

The maximum 35-year disposal mound height (e.g. 3.75m) would reduce the water depth by 3% and is not expected to result in significant refraction or shoaling effects on waves in the 145m water depth at the site (net 2% change in wave height).

Effects on currents are expected to be negligible given the 0.08% reduction in the west-east cross sectional area of the 45km-wide continental shelf.”

Effects on Benthic Fauna

The potential effects on benthic fauna has been addressed in Sections 4.2 and 4.3 of the Bioresarches Assessment (Appendix Five). This assessment states:

“With the increased area of the mound, the addition of material at the disposal point will only result in very thin layers of material at greater distances from the disposal point. It is likely that the benthic biota at the more distant sites (500 m and 1000 m) will show effects, but these effects will remain on the currently measured gradient, from up to 100% reduction at the disposal point to significantly less at the 500 m and 1000 m sites, and no effect at the 1500 m sites. Under this scenario it is likely that a level of recovery will be occurring at the more distant sites and the biota will reach an equilibrium community structure based on the disturbance and recovery occurring.”

And

“The monitoring of the benthic biota at the disposal centre site has shown benthic fauna at the disposal centre site have been affected by the disposal operations, with significant mortality of individuals inhabiting the sediments, most likely as a result of smothering and insufficient recolonization time between successive disposal events. Likewise, the individuals inhabiting the dredged sediments have not survived at the disposal site, most likely due to the change in depth and physical disturbance of dredging and then being buried in the barge of dredge material with limited water space if any.

The geographical extent of the high mortality is not known, but is limited to less than 500 m from the disposal centre site as significant decreases in abundance of biota were not detected at the 500 m sites. Based on the information available from sea bed cores and bathometric studies, the footprint of the disposal mound is elongated west to east, and located within approximately 375 m east and west of the disposal area centre and 250 m north and south. The current consent does not require the assessment of biota recovery, or is it possible given the lack of time between the frequent disposal events, therefore detailed assessment of the biota changes at and around the Disposal Centre site has not been conducted.”

And

“Once sediment disposal has ceased, benthic communities are expected to recover to pre disposal levels, but the time it will take is not able to be stated with any precision as recovery rates are not known for this environment in New Zealand. In the shallower environments of the Ports of Otago disposal area, it has been shown that recovery can be in the order of 6 months (James, et al., 2009). International literature also suggests that muddy sediments have slower recovery rates than sand habitats (Dernie, et al., 2003). If the sediment characteristics, such as grain size and chemistry, differ from the surrounding habitats then recolonization is likely to be slower. The specific recovery rate of invertebrate benthic communities in an unstressed habitat has been estimated to take between 1 and 4 years (Bolam and Rees, 2003). Interestingly, Bolam and Rees (2003), found that communities in more stressed environments only took approximately 9 months to recover. Classic community disturbance literature demonstrates that macro faunal communities in environmentally stressed environments are more naturally resilient (Bolam and Rees, 2003). Since the natural biota of the NDA was in an undisturbed state the recovery back to this state is predicted to take longer than shallow disposal areas such as Otago.

The ongoing disposal at the NDA and other disposal areas will result in a gradation of effects radiating away from the disposal point out to and beyond the influence of disposal material. The effects will depend on the frequency, thickness of deposits, the biota present and their abilities to survive burial by sediments. The effects will therefore be different for different species. The result for a stable disposal volume and frequency will be an equilibrium of limited species and numbers in the centre, with a changing species composition and abundance with distance from the centre, finally becoming no different from the background biota.”

Potential for Spread of Invasive Species

The potential for the spread of invasive species is addressed in Section 4.4 of the Bioresarches Assessment (Appendix Five). This assessment states:

“The invasive species detected at the source sites are summarised in section 2.6. The general ecology of these invasive species is summarised in Appendix One. None of these invasive species are expected to survive on the seabed in the NDA. To date none of these invasive species have been recorded in the benthic biota monitoring from the NDA as presented in Appendix Seven. Unfortunately the threat of invasive species is not limited to the survival of animals at the NDA. By their nature invasive species are highly capable of spreading and colonising new suitable habitats, this is achieved either by rafting of individuals or by natural spawning and dispersion of planktonic larvae. The degree to which invasive species can do this is variable between species, hence each species is discussed separately below. In addition knowledge of the likelihood of water movements resulting in the transport of material to coastal areas adjacent to the NDA is required, which needs to consider multiple time frames and seasonal conditions. Based on existing information MetOcean Solutions was able to provide a model of the trajectory of water bodies including neutrally buoyant plankton (MetOcean, 2018) predicting the likelihood of a waterbody from the NDA reaching the adjacent coast.

Rafting of individuals or groups of individuals is generally considered unlikely in that this would require floatable material on which species could raft. Since the source material is all sediment of material dredged from the sea bed these is not likely to be any floatable material disposed on which invasive species could raft. Dispersion of planktonic larvae from the point of disposal or from spillage in route generally provides the greatest potential threat of spreading unwanted invasive species to areas not previously colonised.”

The Bioresarches Assessment then individually addresses the risk from Mediterranean fan worm, Asian paddle crab, Australian drop tunicate, Clubbed sea squirt, Encrusting Bryozoan, Asian date mussel, Pacific oyster and the Window shell.

Effects on Fin Fish, Mammals and Birds

The potential effects on fin fish, mammals and birds is addressed in Section 4.5 of the Bioresarches Assessment (Appendix Five). This assessment states:

“During each disposal event, the majority of sediment is expected to fall directly to the sea bed in a column. A small plume of fine sediment is expected to occur for a short period down current from the disposal point. Plume monitoring studies undertaken by the University of Waikato showed this plume did not extend beyond the disposal area boundary. The disposal of a barge load of material directly on top of mammals or fish is likely to have adverse effects to the individual animals involved. The current consent

(EEZ900012) controls are in place to prevent disposal of material if mammals are present in the area. The presence of fine sediment plumes will potentially impact on fish present in the water column. However, the plumes are short lived and the fish and mammals are mobile and able to avoid the plumes. Given the low numbers and intermittent presence of these species, the risk of impacts to these species are likely to be low.

Increased turbidity as a result of disposal of material has the potential to reduce light levels and thus potential for primary production by phytoplankton for a period after disposal until the plume has dispersed. However since the majority of disposal events has occurred during the night due to operational constraints, the effect of reduced light is negated.

The reduction in benthic biota in the seabed around the disposal centre site is confined to a relatively small area making the potential impact on the benthic feeding habitat of fish relatively small.

The intermittent activity of disposal operations would create noise disturbance for fin fish and marine mammals in the vicinity. No breeding activity of fish or mammals is known to occur in the disposal area therefore the short duration of the disposal activity, and the likelihood that the individuals will divert to avoid contact, will prevent any significant risk.

Any effects to sea birds will be indirect but localised to the disposal area. There is a small potential for these effects to take the form of reduced food species. The remote from shore location of the NDA means all of the sea birds temporarily present in the disposal area are able to cover a large geographic range thus the slim potential reduction of prey in a small area is not likely to adversely affect any of bird species."

Recreational Effects from the Use of the NDA

No recreational activities within or immediately adjoining the NDA have been identified or raised by other parties through the consultation process or have been identified since the granting of the current consent in 2012. It is therefore considered that there will be no effects on recreational activities from the continued use of the NDA.

Economic Effects from the Use of the NDA

No adverse economic effects from the continued use of the NDA have been identified by the Economic Assessment (Appendix Six). No parties identified potential impacts on existing commercial operations during the consultation process.

Visual and Landscape Effects from the Use of the NDA

The disposal operation is resulting in the creation of a mound on the sea-floor. This mound cannot be observed above the sea surface and it would be extremely unlikely that recreational diving would be occurring in this area.

Owing to the distance from land, the actual disposal operation (including the plume from disposal) is not visible from Great Barrier or Cuvier Islands.

The plume created during the disposal process is both limited in size and is temporary in nature. It could only be observed by any boats in the immediate vicinity or by a low-lying plane crossing the site immediately after disposal. Given the proximity of the disposal site, the infrequent nature of disposal occurring, the lack of recreational activities occurring in this area and the temporary nature of the plume, the risk it would be observed by any other party is very low.

Overall it is considered that any visual or landscape effects from both the disposal operation and the creation of the disposal mound is negligible.

Effects on the Use of the Area by the NZDF

It is recognised that the NZDF is an intermittent user of this area (being part of the wider submarine exercise area). The NZDF is contacted prior to any disposal operation to confirm that the NZDF has no concerns with the period of the disposal operation.

To date there has been a single instance where a potential conflict of timing was identified and this was worked around with the agreement of the NZDF.

In the future event that the NZDF does identify a period when the NDA cannot be used then no disposal is carried out at the NDA during that period.

It is therefore considered that the continued use of the NDA does not impact on the NZDF use of the wider area.

Other Matters

Given the nature and location of the activity, there are no noise, vibration, lighting or odour effects that require consideration.

Cumulative Effects

No potential significant cumulative effects arising from the proposed continued use of the NDA have been identified in either the Beca or Bioreserches Assessments (Appendix Four and Five respectively).

No other potential cumulative effects (ie on recreation, on other users etc) have been identified.

There are no other known consented activities in the immediate area of the NDA which require consideration in terms of potential cumulative effects arising from the use of the NDA and other activities.

No potential reverse sensitivity effects have been identified.

1(e) Identify the effects of the activity on the biological diversity and integrity of marine species, ecosystems, and processes.

This is specifically addressed in Section 4.7 of the Bioreserches Assessment (Appendix Five) which states:

“The continental shelf extends out to 60 km from Great Barrier Island. Sea floor relief of the shelf is relatively uniform, except for small areas of basement outcrop and isolated rock pinnacles, which occur 16 km south and 20 km north west of the disposal area. The Northern Disposal Area ranges in depth from approximately 130 m to 140 m and was characterised by sandy muddy sediments. Beyond the shelf edge, a band of coarser muddy sand extends in a NW direction along the upper slope, down to 300–500 m depth. There are limited sediment and biological samples around this region. NIWA’s marine database for this region, suggests Scleractinia (solitary stony coral) may be present. Scleractinia corals are typically associated more with elevated features such as seamounts or ridges. Scleractinia have not been recorded in the study area as part of either the predisposal studies or the post disposal monitoring studies.

Biodiversity within and beyond the disposal area has not been impacted by the disposal activity to date. No sensitive species or ecosystems have been encountered in the disposal area or are expected to occur in the nearby environment.”

1(f) Identify the effects of the activity on rare and vulnerable ecosystems and habitats of threatened species.

This is addressed in Section 4.8 of the Bioreserches Assessment (Appendix Five). This Assessment concludes in respect to this matter:

“No endangered fish or birds are known to be present or use the NDA.

The disposal area is typical of large areas of the continental shelf in region of New Zealand. Studies to date have shown that the disposal area does not contain any known vulnerable ecosystems or habitats of threatened species. Transitory species such as whales and dolphins are not considered to be affected by the disposition of material on the seabed, but are likely to avoid noise of the disposal activity for the very short periods of the disposal events. The area is not known to be used for breeding activity by marine mammals.”

1(g) Describe any consultation undertaken with persons described in paragraph (c) and specify those persons who have given written approval to the activity

This is addressed in Section Ten of this report.

1(h) Include copies of any written approvals to the activity.

No written approvals have been sought.

1(i) Specify any alternative locations for, or methods for undertaking the activity that may avoid, remedy or mitigate any adverse effects

A historical context of dredged spoil disposal in Auckland is provided in Section 2 of the Beca Assessment (Appendix Four).

An assessment of alternative locations and methods (which is partly based on the July 2010 Assessment by Osbornehay) (Appendix Seven) and the assessments provided in Section 3.1 of the Beca Assessment and Section 1.1 of the Bioresearches Assessment is included in Section Three of this report.

1(j) Specify the measures that could be taken to avoid, remedy or mitigate the adverse effects identified (including measures that the applicant intends to take).

A set of recommended consent conditions are included in Section Nine of this report. These are largely based on the current consent conditions but amended as per recommendations in the Beca and Bioresearches Assessments and from learnings arising from the implementation of the current consent.

The key change, which is a recommendation from Beca, is to shift the location of disposal within the NDA over time to create a larger but lower mound but which is still fully within the disposal area. Appendix Three includes a plan showing the proposed disposal locations within the NDA which will be utilised over time.

Along with the continuation of characterisation testing of spoil to be disposed at the NDA (and approval for its disposal by the EPA on a case by case basis), the implementation of these consent conditions will ensure any effects on the environment are avoided, remedied or mitigated to an appropriate level.

7.2 Assessment under s39(2)(b)

(i) Describe the effects of the activity on human health.

The site is approximately 25 km from Great Barrier Island and 22 km from Cuvier Island and has negligible if any recreational or commercial use at or immediately around it.

The environmental effects observed to date (and which are expected into the future) do not present a risk to human health. The effects have been relatively minor and there is little or no linkage between the disposal site seabed and human health contact. The only potential for human health contact is by fish feeding on the seabed at the disposal site being caught and consumed. The low numbers of fish present and the remote location of the site combine to make the risk of human health contact almost zero.

(ii) Specify any practical opportunities to reuse, recycle, or treat the waste or other matter.

No practical opportunities have been identified to re-use, recycle or treat the spoil. In the event that future reclamation projects were progressed in Auckland there may be an opportunity for spoil to be used for that reclamation. There are currently no reclamation projects in Auckland that can utilise this spoil and we are currently unaware of any consented planned reclamations in Auckland.

7.3 Assessment under Section 59(2B) (which refers back to s59(2))

2(a) Any effects on the environment or existing interests of allowing the activity, including-cumulative effects; and

- (i) **effects that may occur in New Zealand or in the waters above or beyond the continental shelf beyond the outer limits of the exclusive economic zone.**

The Impact Statement of effects on the environment has been completed and forms part of this report.

No existing interests which may be affected by allowing the activity have been identified except the intermittent use of the area by the NZDF. There is an existing process to advise the NZDF of when disposal operations are planned and NZDF can advise CRL if there are periods when the NDA cannot be used. To date there has only been one instance of a potential conflict of timing. It is proposed to continue the current NZDF notification process.

On occasions it is possible that multiple disposals from different vessels may occur within a 24-hour period but provided the time between disposals exceeds 1 hour (the time required for turbidity to return to background levels) it is not anticipated that there will be any short term cumulative effects.

2(b) The effects on the environment or existing interests of other activities undertaken in the area covered by the application or in its vicinity, including –

- (i) **the effects of activities that are not regulated under this Act; and**
- (ii) **effects that may occur in New Zealand or in the waters above or beyond the continental shelf beyond the outer limits of the exclusive economic zone.**

The only lawfully established existing activities that have been identified in relation to the NDA are rights of navigation and fishing (including customary, recreational and commercial fishing). That is, there are no restrictions on any party navigating or fishing through this area.

No other specific uses of the NDA (or the immediate vicinity) have been identified which may be affected by the proposal disposal operation.

No parties consulting during the consultation process identified existing interests or activities which required consideration. As outlined earlier there is an existing process for notification of the NZDF of periods when disposal operations are planned.

2(d) The importance of protection the biological diversity and integrity of marine species, ecosystems, and processes.

This is specifically addressed in Section 4.7 of the Bioreserches Assessment (Appendix Five) which states:

“The continental shelf extends out to 60 km from Great Barrier Island. Sea floor relief of the shelf is relatively uniform, except for small areas of basement outcrop and isolated rock pinnacles, which occur 16 km south and 20 km north west of the disposal area. The outer gulf disposal area ranges in depth from approximately 130 m to 140 m and was characterised by sandy muddy sediments. Beyond the shelf edge, a band of coarser muddy sand extends in a NW direction along the upper slope, down to 300–500 m depth. There are limited sediment and biological samples around this region. NIWA’s marine database for this region, suggests Scleractinia (solitary stony coral) may be present. Scleractinia corals are typically associated more with elevated features such as seamounts or ridges. Scleractinia have not been recorded in the study area as part of either the predisposal studies or the post disposal monitoring studies.

Biodiversity within and beyond the disposal area has not been impacted by the disposal activity to date. No sensitive species or ecosystems have been encountered in the disposal area or are expected to occur in the nearby environment.”

2(e) The importance of protection rate and vulnerable ecosystems and the habitats of threatened species.

This is addressed in Section 4.8 of the Bioreserches Assessment (Appendix Five). This Assessment concludes in respect to this matter:

“No endangered fish or birds are known to be present or use the NDA.

The disposal area is typical of large areas of the continental shelf in region of New Zealand. Studies to date have shown that the disposal area does not contain any known vulnerable ecosystems or habitats of threatened species. Transitory species such as whales and dolphins are not considered to be affected by the disposition of material on the seabed, but are likely to avoid noise of the disposal activity for the very short periods of the disposal events. The area is not known to be used for breeding activity by marine mammals.”

2(h) The nature and effect of other marine management regimes.

This has been addressed in Section 2.2 of this report.

2(i) Best practice in relation to an industry or activity.

The disposal of dredged spoil within the coastal marine area is common practice both in New Zealand and internationally.

The approach to disposal of dredged spoil in Auckland has been somewhat different to other parts of New Zealand, given the environmental, social and cultural sensitivity of the Hauraki Gulf. Section 2 of the Beca Assessment (Appendix Four) provides some of this historical context of dredge spoil disposal in Auckland.

The Auckland Unitary Plan Operative in Part (AUPOP) provides strong direction in respect to coastal reclamation (which is the main practical alternative for the use of dredged sediment). The Regional Policy Statement Policy B8.3.2(9) states:

- (9) *Avoid reclamation of land in the coastal marine area unless all of the following apply:*
- (a) *land outside the coastal marine area is not available for the proposed activity;*
 - (b) *the activity which requires reclamation can only occur in or adjacent to the coastal marine area;*
 - (c) *there are no practicable alternative methods of providing for the activity; and*
 - (d) *the reclamation will provide significant regional or national benefit.*

This is then supported at the “regional coastal plan” level by Objectives F2.2.2.1 and F2.2.2.2 which states:

Objective F2.2.2.

- (1) *The adverse environmental effects of reclamation, drainage or declamation on the coastal marine area are avoided, remedied, or mitigated.*
- (2) *The natural character, ecological values and natural coastal processes of the coastal marine area are not adversely affected by inappropriate reclamation, drainage or declamation.*

Although the construction of reclamations is not prohibited in Auckland and can be consented, the tests set in the RPS policy and supporting Objective F2.2.2 are high. In particular, the requirement to prove there is no practicable alternative and that the reclamation will provide significant regional or national benefits.

These objectives (and their supporting policies) have been specifically included in the AUPOP to reflect that reclamations in Auckland are now generally not acceptable in terms of potential effects on the coastal marine area and environment.

This is not a new approach within Auckland and reflects the contentious history of reclamations in Auckland. The investigation for a new deep sea disposal site by CRL commencing in 2007 reflected that there was a significant risk in Auckland that future disposal of dredged spoil by its use in reclamations or in near shore disposal sites would likely cease or be significantly reduced in the near future and this has since eventuated.

Examples of operational overseas deep-sea sites used for spoil disposal are provided in Section 3.2 of the Beca Assessment (Appendix Four).

In our opinion, the disposal of dredged spoil at the NDA remains the best industry practice in Auckland. The success to date of the use of the NDA and the increasing demand for disposal of dredged sediment at it reflects that the use of the NDA is considered the best options in Auckland. This is further reinforced by the observation that no other parties have sought consents (either under the RMA or the EEZ) for alternative disposal sites to service Auckland in recent years as an alternative to the use of the NDA.

2(k) Relevant regulations (other than EEZ Policy Statements)

This has been addressed in Section 2.3 of this Report.

2(l) Any other applicable law (other than EEZ Policy Statements)

This has been addressed in Section 2.4 of this Report.

2(m) Any other matter the marine consent authority considers relevant and reasonably necessary to determine the application.

No other matters have been identified by the applicant which it considers is relevant and reasonably necessary to determine the application.

An initial meeting was held with EPA Officers on the 12th of April 2017 and the various matters raised in that meeting has been covered in this application documentation.

Subsequent to that meeting, a letter from EPA (dated 1 May 2017) was received and this is included in Appendix Eight. In response to the matters raised in that letter:

- A detailed description of the site has been provided in this Impact Assessment (and the supporting reports).
- The specialist reports assess the outcome of the monitoring undertaken to date.
- The proposed monitoring is outlined through the recommended consent conditions.
- Effects on human health have been addressed.
- Alternative sites and opportunities for re-use, recycle etc have been addressed.

An initial draft of this application was sent to the EPA in September 2017 for their review. The detailed EPA response (dated 20 November 2017) is also included in Appendix Eight. The matters raised in that review have been reviewed by the project team and changes subsequently made to this report and the various supporting specialist reports. It is noted that at the time of the EPA review the Economic Assessment had not been finalised and was therefore not forwarded to the EPA.

7.4 S59(2B)(b)(c) and (d) Matters for the Marine Consent Authority's Consideration.

Those matters requiring consideration under s59(2B)(a) have been addressed above. This section now addresses the residual matters requiring consideration by the Consent Authority under (b), (c) and (d).

S59(2B)(b) The effects on human health of the dumping of waste or other matter, or the abandonment of the pipeline if consent is granted.

The site is approximately 25 km from Great Barrier Island and 22 km from Cuvier Island and has negligible if any recreational use. During site surveys or disposal periods, no commercial or recreational fishing boats have been identified either in the NDA or in the immediate area.

The environmental effects observed to date (and expected in the future) do not present a risk to human health. Adverse environmental effects have been relatively minor and there is little or no linkage between the disposal site seabed and human health contact. The only potential for human health contact is by

fish feeding on the seabed at the disposal site being caught and consumed. The low numbers of fish present and the remote location of the site combine to make the risk of human health contact almost zero.

No commercial fishing groups/representatives responded to the initial consultation letter.

S58(2B)(c) Any alternative methods of disposal of the waste, other matter, or pipeline that could be used.

Disposal of dredged material from the Auckland Region has been a historical requirement and is highly likely to continue into the future due to the effects of sedimentation occurring within marinas and ports in the Auckland Region.

Section 2 of the Beca Assessment (Appendix Four) provides a summary of the historical context of the disposal of dredged material in Auckland. Since the findings of DOAG in 1993, the requirement for a new deep-sea disposal site in Auckland has been identified. In 2007, CRL in conjunction with the University of Waikato identified then investigated a possible new site (now known as the NDA) with CRL obtaining consent for marine dumping in the NDA in 2013.

It is noted that DOAG identified a number of disposal options and these are summarised in Section 3.1.1 of the Beca Assessment (Appendix Four). Apart from reclamation and marine disposal in water deeper than 100 m, no other options were considered applicable. These options were beach nourishment, habitat enhancement or creation, disposal to sanitary landfill, commercial and industrial applications, solid landfill, disposal to Lake Pupuke and forestry applications.

We are unaware why any of these options would now be applicable, practicable or consentable in Auckland and, as outlined earlier in this report, they have not been considered further.

An assessment of alternative locations and operations was required to be provided as part of the application for the original dumping consents. In response to a request from MNZ during the processing of the application, a further detailed assessment of alternative options was provided. This assessment (Osbornehay letter, dated 23 July 2010) is included in Appendix Seven.

Within Section Three of this report is an updated assessment of alternative options based on that 2010 assessment and the assessments of historical disposal options provided in Section 1.1 of the Bioresearches Assessment (Appendix Five) and Section 3.1 of the Beca Assessment (Appendix Four).

S58(2B)(d) Whether there are practical opportunities to re-use, recycle, or treat the waste, other matter, or pipeline

No practical opportunities for the re-use of the marine sediment have been identified. With the cessation of reclamation at the Ports of Auckland and with no other reclamation projects currently planned in Auckland, there are no current opportunities to use marine sediment as mudcrete in reclamation projects.

The dredged material is not suitable for beach re-nourishment projects in Auckland.

The dredged material is not suitable for site development fill material in Auckland.

7.5 S59(3) Matters

Under s59(3) the consent authority must also have regard to:

- (aa) EEZ Policy Statements
- (a) Any submissions made and evidence given in relation to the application
- (b) any advice, reports, or information sought under this part and received in relation to the application
- (c) Any advice received from the Maori Advisory Committee.

In respect to these matters it is noted:

- There are no specific EEZ policy statements requiring consideration.
- In respect to s59(3B) (a), (b) and (c), the application is still to be notified and the advice and reports received in terms of (b) and (c) will be obtained by EPA during the processing of the application.

7.6 Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015

Under **s38(2)(c)** of the EEZ, the impact statement must include any requirements prescribed in regulations. For this application, the Exclusive Economic Zone and Continental Shelf (Environmental Effects - Discharge and Dumping) Regulations 2015 is required to be considered. Section 36 of this regulation outlines those matters that must be included in the impact statement. Section 36 states:

36 *Matters that must be included in impact assessment for marine dumping consent*

In addition to the matters required under section 39 of the Act, an impact assessment included in an application for a marine dumping consent must—

- (a) describe the effects on human health of the activity; and*
- (b) describe any alternative method of disposal that could be used; and*
- (c) specify any practical opportunities to reuse, recycle, or treat the waste.*

These three matters have been addressed in this Impact Statement.

8. Environmental Management, Monitoring and Reporting

This section outlines how the consent is (and is to continue to be) managed by CRL, the environmental management practices that occur and the proposed environmental monitoring and report.

8.1 Organisation Structure and Responsibilities for Management the Consent

Proposed Consent Holder: Coastal Resources Ltd (CRL)

CRL is responsible for:

- 1 Internally confirming that EPA approval of the sediment characterisation of the dredged material to be disposed of has been received. CRL requires a copy of the test results and reviews them internally. It is noted that currently Bioresearches Ltd undertakes the sediment characterisation testing for any CRL jobs and is recommended to other potential clients by CRL given their experience in undertaking this testing and obtaining EPA approval.
- 2 For recording dates and volumes of material disposed of at the NDA and reporting this data to EPA.
- 3 For organising and funding the NDA monitoring required under the consent and for providing the results to EPA.
- 4 For notifying the NZDF in accordance with the consent condition.
- 5 For ensuring that any third party travelling to the NDA site is aware of the relevant consent conditions.
- 6 For collating from the tug/barge skipper the whale monitoring recordings.
- 7 Checking and collating trip data from the tug/barge skipper (photos, logs, emails, disposal location, recordings etc) for every trip and providing this to the EPA each month in a report.
- 8 Ensuring that notification for each trip has been completed on time and in the correct manner and sent to all required parties.
- 9 Ensuring that conditions of the permit are met and are compliant.

At the current time, the CRL administration person for this consent reports directly to the Managing Director of CRL (Mr Simon Male). Likewise the skipper of TR Healey also reports directly to Mr Male.

As outlined earlier in this report, the current consent implementation has been audited twice by EPA and no significant issues were identified and a number of practice improvements have been implemented to better meet the needs of CRL and EPA. This in part reflects the change-over in the consenting authority and the reporting structure and requirements of the EPA.

8.2 Environmental Management

Only spoil material which has been approved by EPA can be disposed of at the NDA. The following sediment characterisation testing is proposed for material to be disposed of at the NDA (and which is required to be undertaken prior to disposal and before CRL accepts that the material may be disposed of at the NDA).

- a) Before any collection occurs from a source site, the Consent Holder must complete pre-disposal sampling of sediments for dredging. All pre-disposal sampling must include physical nature, contaminants and biosecurity threats. All pre-disposal sampling for capital dredging must consider dredging depths and the potential for layered contamination.

- i The Consent Holder must submit to the EPA, for written approval, a sampling plan prior to undertaking pre-disposal sampling. The sampling plan must include comment regarding sampling for biosecurity threats from MPI (or its successor).
 - ii The Consent Holder must submit the sampling results to the EPA for approval, before removal of sediment for-disposal is permitted. The sampling results must include comment regarding biosecurity threats from MPI (or its successor).
 - iii The Consent Holder may remove sediment from that source site for dumping only upon the prior written approval by the EPA of the sampling results.
- b) The sampling results of testing for physical nature and contaminants of the sediment must conform with the limits contained in the ANZECC ISQG guidelines.
- c) The process stated in (a) above must be repeated:
- i For each proposed capital dredging source site, at a frequency agreed by the EPA in the sampling plan, which in any case will be at least once every three years, and
 - ii For each proposed maintenance dredging source site, once every three years, and
 - iii If the Consent Holder becomes aware of any event which would indicate a likely change in the characteristics of the sediments collected for disposal from a source site (such as, without limitation, a pollution event, operational activities, or arrival of a vessel compromised with an exotic organism) that could increase levels of contamination or biosecurity risk.

If CRL becomes aware of any of the circumstances or events in paragraphs (a) to (g) below then they will notify the EPA by the close of the business day following the Consent Holder becoming aware of such an event.

- a) The disposal activity results in, or is likely to result in, an effect on the marine environment that is more than a minor adverse effect,
- b) Contaminants occur in sediments on the disposal area or monitoring area at a level in excess of ANZECC ISQG-L,
- c) Sediment size class within a core sample changes by more than 50% by volume compared to the baseline results from the previous Consent issued by MNZ numbered 555,
- d) A significant difference occurs in the biotic communities at any sampling site (relative to natural fluctuations at the control site),
- e) The sediment plume (visually observed) drifts beyond the boundary of the disposal area,
- f) A risk of spread of an exotic organism is identified, or
- g) The material already disposed of (ie the disposal mound) is identified as moving towards the site boundary.

In the event that, for any reason, emergency or otherwise, material is disposed outside of the NDA, CRL will notify the EPA and the Auckland Harbourmaster within 24 hours. Such notification must include the quantity dumped, the exact location and the date and time the dumping occurred. Such notification must also include an explanation of the reasons for the dumping.

8.3 Environmental Monitoring

Monitoring of the NDA site has been undertaken in terms of the current consent since 2013 and the results of that monitoring have been included in the Beca and Bioreserches Assessments (Appendix Four and Five). It is proposed to continue this monitoring with some refinements.

The following monitoring of the NDA site is proposed:

1. The post-disposal monitoring shall be as follows:
 - a) Monitoring for bathymetric changes to the sea floor will be undertaken with equipment capable of achieving MB-2 accuracy or better and will cover the disposal area. Monitoring must also include multi beam acoustic backscatter and/or side scan sonar to provide an additional measure of the accumulated seafloor sediments. This is a continuation of the current monitoring being undertaken.
 - b) Core sample monitoring will be conducted at 100 m intervals along axes from the Disposal Site centre such that the extent and side slope of the disposal mound is identified. Once no disposal sediment is observed along an axes, core sample monitoring will be conducted at intervals of 50 0m from the Disposal Site centre. Axes will be aligned in onshore (W) offshore (E) and along shore (N, S) directions. Beyond 500 m from the Disposal Site centre an additional axes will be added midway between axes (NE, SE, SW and NW directions). A single core sample will be collected and photographed and measured from each site including the depth of any disposal material visible in the sample.
 - c) Contaminant analysis of sediments on axes throughout the Disposal Area with a minimum of 13 sampling sites and a control site included. Monitoring should also be undertaken at four sites midway between the sites on the boundary (ie. the sites beyond the boundary should be in a NE, SE, SW and NW direction from the site centre) at a distance of 250 m beyond the Disposal Area boundary.
 - i Sites within the Disposal Area should be distributed on axes with incremental distances of 500 m from the Disposal Site Centre
 - ii Contaminant analysis should be undertaken on the top five centimetres of sediment in each core using standardised methods and compared to the ANZECC ISQG-L guidelines (and any future updates).
 - d) Sediment grain size analysis on axes throughout the Disposal Area with a minimum of 13 sampling sites and a control site included. Monitoring should also be undertaken at four sites midway between the sites on the boundary (i.e. the sites beyond the boundary should be in a NE, SE, SW and NW direction from the site centre) at a distance of 250 m beyond the Disposal Area boundary.
 - i Sites within the Disposal Area should be distributed on axes with incremental distances of 500 m from the Disposal Site Centre.
 - ii Sediment grain size should be undertaken using accepted standardised methods.
 - e) Benthic faunal monitoring to identify any significant effects on the benthos.
 - i This should be undertaken at a control site, the Disposal Site centre, and a minimum of four sampling sites equally spaced on the boundary of the Disposal Area
 - ii Sampling should include a minimum of three replicates for each sampling site.
 - iii Additional sampling sites will be to be added if:
 - (a) any of the contaminant analysis identifies sampling sites where contaminants are above ANZECC ISQG-L levels; or
 - (b) the presence of dredge spoil material is recorded in sediment within 250m of a site sampled under 1(c) above.

All post-disposal monitoring results shall be provided to the EPA within four months of the event that triggered the monitoring (e.g., the relevant volume or triggering period).

During the course of disposal operations, the Consent Holder will undertake observations for marine mammals for at least 30 minutes immediately prior to any disposal activity. The observation must be in accordance with the equipment, specifications and processes approved by the EPA (which it is expected

will be the same as the currently approved process which is included in Appendix Nine). Dumping activity may only occur provided there is no evidence of marine mammals within the disposal area.

CRL operates a survey boat suitable for undertaking the site monitoring (including bathymetric surveys and core-sampling).

CRL currently utilises Survey Worx for survey/survey interpretation and Biosearches Ltd for the benthic and sediment sampling and analysis.

As outlined earlier in this section, CRL has an internal administration staff member responsible for the collection and reporting of information required under the consent conditions.

CRL owns a hydrophone suitable for the detection of mammals (and which was originally approved by MNZ) and this is provided to operators using the NDA site.

8.4 Reporting

As per the current consent requirement, CRL shall allow the EPA (or its representative or delegate) to attend in an observer status during the Consent Holder's monitoring surveys and CRL will meet the reasonable cost of this. To date, neither MNZ or more recently EPA have asked to have a representative or delegate to attend in an observer status.

The sediment characterisation testing outlined under Environmental Management above is required to be submitted to the EPA for approval before the material can be accepted for disposal at the NDA.

All post-disposal monitoring results (as outlined above under Environmental Monitoring) are provided to the EPA within four months of the event that triggered the monitoring. Monitoring results are presented in a written scientific report.

CRL (or the tug/barge operator on their behalf) lodges a passage plan with the Auckland Harbourmaster's office at least 12 hours in advance of planned departure if the proposed passage to be used has not previously been subject to a passage plan submitted to the Auckland Harbourmasters office

CRL (or the tug/barge operator on their behalf) notifies, via email, telephone or radio (VHF Channel 12 or 16), the Auckland Harbourmaster's office for every disposal voyage:

- a) The disposal vessel's time of departure from the Marina before such departure, and
- b) The disposal vessel's time of arrival at the NDA, and
- c) The disposal vessel's time of return to the Auckland port precincts.

CRL provides the following written records to the EPA each calendar month in a Form of Acknowledgement, for each individual load of dredged material:

- a) The Source Site;
- b) The time and date of all notifications to the Auckland Harbourmaster;
- c) The actual amount disposed;
- d) The exact location of disposal determined by GPS;
- e) The date, time and duration of any disposal;
- f) The date, time and duration of all monitoring;
- g) Any observations of marine mammals presence in the Disposal Area;
- h) The vessel's daily log book covering the voyages to and from the Disposal Area, and

i) GPS data

During a month when there is no disposal a Form of Acknowledgement is still provided to the EPA advising them of this.

EPA audits the CRL processes on a regular basis and this is expected to continue.

9. Proposed Consent Conditions

Section 63 of the EEZ allows for the EPA to set conditions on the consent. Based on current experience with the existing consent and the recommendations in the Beca and Bioreserches Assessments (Appendix Four and Five respectively) the following conditions are recommended:

CONDITIONS OF CONSENT

Definitions:

- a) **ANZECC ISQG-L** means Australian and New Zealand Environment and Conservation Council Interim Sediment Quality Guidelines (ISQG) Low as amended from time to time.
- b) **EPA** means the Environmental Protection Authority
- c) **Disposal Area** means a 1500 metre radius circle centred on 36° 12.3403'S and 175° 48.002"E.
- d) **Disposal Site Centre** is 36° 12.3403'S and 175° 48.002"E.
- e) **Disposal Point** means the point where the spoil is disposed at.
- f) **Marine Consent** means this consent granted by the EPA to Coastal Resources Limited.
- g) **Disposal Site Centre** means the point designated by the following longitude and latitude coordinates: 36° 12.3403'S and 175° 48.002"E.
- h) **Exotic Organism** means any one organism (plant or animal) that is not native in the Source Sites, Disposal Area and/or Disposal Monitoring Zone.
- i) **Form of Acknowledgement** means the provision in writing of the information required in these conditions.
- j) **Consent Holder** means Coastal Resources Limited.
- k) **Sampling Site** means any location from which samples are collected for the purposes of compliance with monitoring conditions (pre-disposal and post-disposal).
- l) **Source Site** means a site from which sediment is intended to be sourced for disposal.
- m) **Submarine Exercise Area** means that area by the same name identified on chart NZ531 and the associated New Zealand Notices to Mariners.
- n) **MPI** means the Ministry for Primary Industries.
- o) **Business Day** means Monday to Friday but not including public holidays for the Auckland region.

1. In order for the EPA to determine the detailed description and characterisation of the waste to be collected for disposal:

- a) Before any collection occurs from a Source Site, the Consent Holder must complete pre-disposal sampling of sediments for dredging. All pre-disposal sampling must include physical nature, contaminants and biosecurity threats. All pre-disposal sampling for dredging must consider dredging depths and the potential for layered contamination.
- i) The Consent Holder must submit to the EPA, for written approval, a Sampling Plan prior to undertaking pre-disposal sampling. The Sampling Plan must include comment regarding sampling for biosecurity threats from MPI (or its successor).

- ii The Consent Holder must submit the Sampling Results to the EPA for approval, before removal of sediment for-disposal is permitted. The Sampling Results must include comment regarding biosecurity threats from MPI (or its successor).
 - iii The Consent Holder may remove sediment from that Source Site for dumping only upon the prior written approval by the EPA of the Sampling Results.
 - b) The Sampling Results of testing for physical nature and contaminants of the sediment must conform with the limits contained in the ANZECC ISQG guidelines.
 - c) The process stated in Condition 1 (a) above must be repeated:
 - i For each proposed capital dredging Source Site, at a frequency agreed by the EPA in the Sampling Plan, which in any case will be at least once every three years, and
 - ii For each proposed maintenance dredging Source Site, once every three years, and
 - iii If an event referred to in Condition 6 below occurs.
- 2. During the entire term of this Consent, the Consent Holder must undertake post-disposal monitoring ("the post-disposal monitoring"), in order to assess the extent of environmental impacts. The post-disposal monitoring shall be as follows:
 - a) Monitoring for bathymetric changes to the sea floor will be undertaken with equipment capable of achieving MB-2 accuracy or better and will cover the disposal area. Monitoring must also include multi beam acoustic backscatter and/or side scan sonar to provide an additional measure of the accumulated seafloor sediments. The monitoring described in this condition must be undertaken at the periods described in Condition 2e.
 - b) Core sample monitoring will be conducted at 100 metre intervals along axes from the Disposal Site Centre such that the extent and side slope of the disposal mound is identified. Once no disposal sediment is observed along an axis, core sample monitoring will be conducted at intervals of 500m from the Disposal Site Centre. Axes will be aligned in onshore (W) offshore (E) and along shore (N, S) directions. Beyond 500m from the Disposal Site Centre an additional axes will be added midway between axes (NE, SE, SW and NW directions). A single core sample will be collected and photographed and measured from each site including the depth of any disposal material visible in the sample. All of the monitoring described in this condition must be undertaken at the periods described in Condition 2e.
 - c) Contaminant analysis of sediments on axes throughout the Disposal Area with a minimum of 13 sampling sites and a control site included. Monitoring should also be undertaken at four sites midway between the sites on the boundary (i.e. the sites beyond the boundary should be in a NE, SE, SW and NW direction from the site centre) at a distance of 250m beyond the Disposal Area boundary. These sites coincide with some of the single core sample monitoring sites covered in condition 2b.
 - i Sites within the Disposal Area should be distributed on axes with incremental distances of 500m from the Disposal Site Centre
 - ii Contaminant analysis should be undertaken on the top five centimetres of sediment in each core using standardised methods and compared to the ANZECC ISQG-L guidelines (and any future updates).
 - iii The frequency of this monitoring shall be as set out in Condition 2e below.
 - d) Sediment grain size analysis on axes throughout the Disposal Area with a minimum of 13 sampling sites and a control site included. Monitoring should also be undertaken at four sites midway between the sites on the boundary (i.e. the sites beyond the boundary should be in a NE, SE, SW and NW direction from the site centre) at a distance of 250m beyond the Disposal Area boundary. These sites coincide with some of the single core sample monitoring sites covered in condition 2b.

- i Sites within the Disposal Area should be distributed on axes with incremental distances of 500m from the Disposal Site Centre.
 - ii Sediment grain size should be undertaken using accepted standardised methods.
 - iii The frequency of this monitoring shall be as set out in Condition 2e below.
- e) The Consent Holder shall undertake the specified monitoring and analysis referred to above in (a) – (d) when a cumulative total of 125,000 ± 25,000 cubic metres of dredge spoil has been disposed following the date the consent is given effect to, and at every 125,000 ± 25,000 cubic metres thereafter.
- f) Benthic faunal monitoring to identify any significant effects on the benthos.
- i This should be undertaken at a control site, the Disposal Site Centre, and a minimum of four sampling sites equally spaced on the boundary of the Disposal Area.
 - ii Sampling should include a minimum of three replicates for each sampling site.
 - iii Additional sampling sites will be to be added if:
 - (a) any of the contaminant analysis (stated in Condition 2(c) identifies sampling sites where contaminants are above ANZECC ISQG-L levels or
 - (b) the presence of dredge spoil material is recorded in sediment within 250m of a site sampled under condition 2(c)).
 - iv The sampling will be conducted annually in spring (September, October or November). Provided the previous sediment quality survey (sampled under condition 2(c)) does not require additional benthic biota sample sites (as required under condition 2(f)(iii)) not sampled in the previous sampling event, the sampling can be deferred to spring the following year if less than 50,000 m³ has been disposed in the year preceding 1 September and the forecast disposal volume for the year from 1 September is less than 100,000 m³. However, sampling will be conducted at no greater than 2 yearly intervals.
 - v If core sampling monitoring (as required under Condition 2b) has not been conducted in the preceding twelve months these should be conducted concurrently.
3. All post-disposal monitoring results carried out pursuant to Condition 2 above shall be provided to the EPA within four months of the event that triggered the monitoring (e.g., the relevant volume or triggering period). Monitoring results must be presented in a written scientific report. Results for monitoring under Condition c), d) and e) shall include statistical analysis and or a comparison of the results to relevant Guidelines.
4. Disposal in the four-month period after the event that triggered the monitoring (or to the date the monitoring report is submitted and accepted by EPA if this is prior to the end of this four month period) shall not exceed 80,000 cubic metres until such time that the monitoring report is accepted by the EPA.
5. Upon the EPA's request, the Consent Holder shall allow the EPA (or his representative or delegate) to attend in an observer status during the Consent Holder's monitoring surveys. The Consent Holder shall bear the reasonable costs of the EPA's attendance.
6. If the Consent Holder becomes aware of any event which would indicate a likely change in the characteristics of the sediments collected for disposal from a Source Site (such as, without limitation, a pollution event, operational activities, or arrival of a vessel compromised with an exotic organism) that could increase levels of contamination or biosecurity risk, the Consent Holder must:
- a) Suspend loading operations from that Source Site immediately upon the Consent Holder becoming aware of such an event.

- b) Notify the EPA of the event by the close of the Business Day following the Consent Holder becoming aware of such an event.
 - c) For that Source Site, undertake the process set out in Condition 1 (a), in order to determine the detailed description and characterisation of the waste to be collected for disposal.
 - d) Not resume loading operations from that Source Site, until the EPA provides prior written approval of the Sampling Results, as per Condition 1 (a)(iii) above.
7. If the Consent Holder becomes aware of any of the circumstances or events in paragraphs (a) to (g) below:
- a) The disposal activity results in, or is likely to result in, an effect on the marine environment that is more than a minor adverse effect,
 - b) Contaminants occur in sediments on the Disposal Area or Monitoring Zone at a level in excess of ANZECC ISQG-L,
 - c) Sediment size class within a core sample changes by more than 50% by volume compared to the baseline results from the previous Consent numbered 555 issued by Maritime New Zealand to the Consent Holder and dated 22 December 2009,
 - d) A significant difference occurs in the biotic communities at any sampling site (relative to natural fluctuations at the control site),
 - e) The sediment plume (visually observed or determined through monitoring equipment) drifts beyond the boundary of the Disposal Area,
 - f) A risk of spread of an Exotic Organism is identified, or
 - g) The material already disposed of is identified as moving towards the site boundary.
- the Consent Holder must notify the EPA by the close of the Business Day following the Consent Holder becoming aware of such an event.
8. The Consent Holder shall not source material from a Source Site, or dispose into the Disposal Area:
- a) Any material which cannot be moved by mechanical means, and
 - b) Any material "pumped" or mixed with water to produce a slurry.
9. The Consent Holder shall only dispose of material in the Disposal Area by 'bottom dump' barge and there is to a minimum of 1 hour between barge unloading at the Disposal Area.
10. The location of the disposal point will vary following disposal of up to 250,000 ± 1,000 cubic metres. The Consent Holder must ensure that the barge operator releases all loads of sediment within 100 metres of the operational disposal points as follows (with disposal commencing again at (a) once disposal is completed at (m)):
- a) 0 – 250,000 ± 1,000 cubic metres, operational disposal point (DS), being 36° 12.3403' S, 175° 48.002' E (WGS 84)
 - b) 250,000 – 500,000 ± 1,000 cubic metres, operational disposal point (W200), being 36° 12.388' S, 175° 47.880' E (WGS 84)
 - c) 500,000 – 750,000 ± 1,000 cubic metres, operational disposal point (N200), being 36° 12.244' S, 175° 47.945' E (WGS 84)
 - d) 750,000 – 1,000,000 ± 1,000 cubic metres, operational disposal point (E200), being 36° 12.299' S, 175° 48.123' E (WGS 84)

- e) 1,000,000 – 1,250,000 ± 1,000 cubic metres, operational disposal point (S200), being 36° 12.441' S, 175° 48.055' E (WGS 84)
 - f) 1,250,000 – 1,500,000 ± 1,000 cubic metres, operational disposal point (W400), being 36° 12.432' S, 175° 47.759' E (WGS 84)
 - g) 1,500,000 – 1,750,000 ± 1,000 cubic metres, operational disposal point (NW400), being 36° 12.271' S, 175° 47.750' E (WGS 84)
 - h) 1,750,000 – 2,000,000 ± 1,000 cubic metres, operational disposal point (N400), being 36° 12.146' S, 175° 47.890' E (WGS 84)
 - i) 2,000,000 – 2,250,000 ± 1,000 cubic metres, operational disposal point (NE400), being 36° 12.148' S, 175° 48.091' E (WGS 84)
 - j) 2,250,000 – 2,500,000 ± 1,000 cubic metres, operational disposal point (E400), being 36° 12.253' S, 175° 48.246' E (WGS 84)
 - k) 2,500,000 – 2,750,000 ± 1,000 cubic metres, operational disposal point (SE400), being 36° 12.423' S, 175° 48.249' E (WGS 84)
 - l) 2,750,000 – 3,000,000 ± 1,000 cubic metres, operational disposal point (S400), being 36° 12.539' S, 175° 48.109' E (WGS 84)
 - m) 3,000,000 – 3,250,000 ± 1,000 cubic metres, operational disposal point (SW400), being 36° 12.553' S, 175° 47.904' E (WGS 84)
11. During the course of Disposal Operations, the Consent Holder must undertake observation for marine mammals for at least 30 minutes immediately prior to any disposal activity. The observation must be in accordance with the equipment, specifications and processes previously approved by the EPA. Dumping activity may only occur provided there is no evidence of marine mammals within the disposal area. If evidence of marine mammals is obtained this will be retained to enable identification of the species and numbers involved. Marine mammal data will be summarised in the annual biota report.
12. At least ten days prior (or alternatively at a timeframe agreed to with the New Zealand Defence Force) to any scheduled disposal operation, the Consent Holder must notify the New Zealand Defence Force of the scheduled disposal operation to ensure there is no conflict with military use of the Submarine Exercise Area. Should any such conflict arise, the New Zealand Defence Force's current or intended military use of the Submarine Exercise Area shall take precedence.
13. The Consent Holder shall supply the EPA, at any time if requested by the EPA, proof in writing that the requirements of Condition 11 have been met.
14. The Consent Holder must ensure any disposal vessel has an active Automatic Identification System fitted and operational throughout the duration of each voyage.
15. The Consent Holder must lodge a passage plan with the Auckland Harbourmaster's office at least 12 hours in advance of planned departure if the proposed passage to be used has not previously been subject to a passage plan submitted to the Auckland Harbourmasters office
16. The Consent Holder must notify, via email, telephone or radio (VHF Channel 12 or 16), the Auckland Harbourmaster's office for every disposal voyage:
- a) The disposal vessel's time of departure from the Marina before such departure, and
 - b) The disposal vessel's time of arrival at the Disposal Area, and
 - c) The disposal vessel's time of return to the Auckland port precincts.

17. The Consent Holder must maintain written records of the following matters, and provide them to the EPA each calendar month in a Form of Acknowledgement, for each individual load of dredged material:
 - a) The Source Site,
 - b) The time and date of all notifications to the Auckland Harbourmaster,
 - c) The actual amount disposed,
 - d) The exact location of disposal determined by GPS,
 - e) The date, time and duration of any disposal,
 - f) The date, time and duration of all monitoring,
 - g) Any observations of marine mammals presence in the Disposal Area, and
 - h) The vessel's daily log book covering the voyages to and from the NDA.
18. At the time of providing the EPA with a Form of Acknowledgment, the Consent Holder must also provide the EPA with GPS evidence supporting the information required in Condition 17(d), (e) and (f).
19. If no collection from a Source Site, or disposal at the Disposal Area, occurred during a calendar month, the Consent Holder must provide to the EPA a Form of Acknowledgement stating the same.
20. The Form of Acknowledgement, referred to in conditions within this Consent, must be provided to the EPA on the 15th day of the month following the calendar month in which the event that triggered the need for the Form of Acknowledgement (eg. a load of dredged material was dumped or a calendar month passed without any dumping) occurred.
21. In the event that, for any reason, emergency or otherwise, material is disposed outside of the authorised Disposal Area, the Consent Holder must notify the EPA and the Auckland Harbourmaster within 24 hours. Such notification must include the quantity dumped, the exact location and the date and time the dumping occurred. Such notification must also include an explanation of the reasons for the dumping.

10. Consultation

This section outlines the identified of persons with interests in the NDA area and the consultation undertaken.

Section **39(1)(c)** requires this impact statement to identify persons whose existing interests are likely to be adversely affected by the activity.

Section **39(1)(g)** requires that this impact statement outlines any consultation undertaken with persons described in 39(1)(c) and to specify those persons who have given written approval to the activity. No parties were requested to provide their written consent.

10.1 Identification of Persons with Interests Under s39(1)(c)

For the 2007 marine dumping permit application to MNZ for the NDA, consultation was initiated with a range of parties identified by MNZ as potentially having an interest. These included various iwi representatives and a range of fishery interests along with a number of Regional Councils and the NZDF.

At the start of that consultation process a small number of parties responded wanting further details on the site location. Three iwi representatives then sought further consultation which was then progressed and this is outlined below. Apart from those iwi representatives, the then Auckland Regional Council and the NZDF, no other parties sought further consultation after the provision of further information. As an outcome of that earlier consultation process the NZDF is contacted prior to each disposal period to confirm there are no conflicts with any operations they may have planned in that area.

For the 2007 application, Ngati Wai, Ngati Rehua and Ngati Manuhiri sought further consultation and were then consulted through the process (with MNZ being involved in part of this process) and a Cultural Impact Assessment was prepared by the Ngati Wai Trust Board. The trial disposal process was an outcome of that consultation process so that the actual effects of a limited period and volume of disposal could be assessed (and which was agreed upon at the 10 August 2009 meeting attended by MNZ, iwi representatives and CRL representatives). After the completion of the trial, the monitoring reports were sent to Ngati Wai and Ngati Rehua with both groups then responding that they continued to oppose sea disposal and their preference remained for a land disposal option. In July 2012, MNZ sent to Ngati Wai, Ngati Rehua, Te Wariki Hekeraka and Auckland Council the final draft Site Management Plan and Monitoring Plan for comment prior to the consent being finalised and no further response was received from these parties and the consent was subsequently granted.

No interested parties (apart from NZDF) have contacted CRL (or as far as we are aware MNZ or EPA) about the disposal operation since it commenced after the granting of the 2012 permit.

For the last two monitoring programmes (at 150,000 m³ and 200,000 m³) the EPA has requested that prior to physical monitoring at the NDA (as required by the current consent) that ninety (for the 150,000 m³) and then ninety-four (for the 200,000 m³) iwi representatives be contacted by CRL to advise them of the proposed monitoring. It is unclear how EPA has determined that the ninety then ninety-four iwi representatives are parties of interest. The vast majority of parties contacted have not responded and a number have queried as to why they are being contacted. For the first round of contact four parties responded and requested further details or clarification and in the latest round (late 2017) eight parties responded with some requesting further details or background information on the activity.

At a meeting on the 12th of April 2017, the EPA advised that the list of kaitiaki contacts for the area on the Auckland Council website could be the basis for identifying which iwi representatives to contact (and were potentially persons with interests) for this new marine dumping consent application.

No other parties have been identified by the EPA as having a potential interest in the NDA.

It is considered that there is no definitive list of persons with interests with NZDF being the only party previously identified as having a specific interest. It was also determined during the last consultation process that Ngati Wai, Ngati Rehehu and Ngati Manuhiri had a strong interest in this area.

10.2 Consultation Undertaken under s39(1)(g)

Owing to the relatively low level of interest during the earlier application process (apart from specific iwi groups which are addressed separately below), it was proposed to notify the same parties as in 2007 by way of an introductory letter to identify if any parties required further information or consultation. A copy of this letter is included in Appendix Ten. In addition, given their involvement in the spoil characterisation monitoring, the consultation letter was also sent to the Ministry of Primary Industries (MPI). As a result of the local government re-organisation in Auckland, the consultation letter was also sent to Auckland Council (which replaced the Auckland Regional Council).

As outlined above, at the meeting with the EPA on the 12th of April 2017, the EPA advised that the list of Kaitiaki contacts for the area on the Auckland Council website could be the basis for identifying which iwi representatives to contact.

A list of parties which the consultation package was being sent to was sent to the EPA on the 5th of September 2017 and no feedback was received in respect to that list.

The following parties were sent an initial consultation package (included in Appendix Ten) in early September 2017 and asked to contact Osbornehay if there had an interest in the proposal and wished to be consulted further.

- Auckland Council
- Coromandal Scallop Fishermens Association
- Department of Conservation
- Waikato Regional Council
- Federation of Commercial Fishermen
- Fisheries Inshore New Zealand
- Land Information New Zealand
- Ministry of Primary Industries (Operations)
- Northern Fisheries Management Stakeholders Group
- Northland Regional Council
- NZ Defence Force
- Seafood Industry Group
- The NZ Rock Lobster Industry council
- Ngati Wai
- Ngāti Manuhiri Kaitiaki Charitable Trust
- Ngāti Rehua Trust
- Ngāi Tai Ki Tāmaki Trust
- Ngāti Maru Rununga
- Ngāti Whanaunga Incorporated Society
- Ngāti Tamaterā

Of these parties, the following requested further information or consultation:

In an email dated 5 September 2017, Ngati Rehua (through the Ngati Rehua Trust) confirmed they are the mana whenua of Aotea and they were to consider the application further.

In an email dated 11 September 2017, the Ngai Tai Ki Tamaki Tribal Trust confirmed they had an interest in this area and required further information.

In an email dated 13 September 2017, Ngati Manuhiri (through the Manuhiri Kaitiaki Charitable Trust) confirmed they had an interest and wished to be consulted further.

In an email dated 14 September 2017, the Ngati Maru Rununga confirmed they were not currently opposed to the proposal.

In an email dated 15 September 2017, the MPI confirmed they wished to be consulted further and would send a letter outlining their comments.

Also on the 15th of September 2017, Auckland Council confirmed they wished to be consulted further.

On the 20th of September 2017, Mr Mike Baker of Ngāti Whanaunga Incorporated Society phoned to say they wished to be consulted but at this stage were happy to read the reports and respond in writing.

No other parties responded.

10.3 Consultation Outcomes under s39(1)(G)

MPI provided a written response on the 20th of November 2017 which is included in Appendix Ten. The matters raised in the written response have subsequently been addressed in the updated reports. In particular the issue of invasive pest species has been addressed in Section 4.4 of the Bioreserches Assessment (Appendix Five).

The Auckland Council sought further information on the proposal and then a meeting. On the 29th of October 2017 and prior to the meeting, AC provided a memo on the matters they wanted covered at the meeting (included in Appendix Ten). It is noted that the Council officers involved in the review had changed from those Council officers involved in the 2007 application or earlier disposal applications within the territorial boundaries of the former Auckland Regional Council and therefore there was some transfer of knowledge required in order to provide the background to the status of spoil disposal in Auckland. The meeting was subsequently held on the 20th of October 2017. The key issues covered were:

Risk assessment of barge loads: It was considered that this was a matter outside the permit application process with the operation of the barges being controlled by MNZ and the Auckland Council Harbourmaster.

Biosecurity risk: Auckland Council explored the idea of having a consent condition requiring that all dredged material is stored on-shore for 7 days. This was undertaken for the capital dredging at Sandspit where there was a specific Mediterranean fan worm risk. The applicant remains of the view that the testing currently done is adequate. If there are specific sites in Auckland where Auckland Council has a concern then the dredging consent issued by Auckland Council can set conditions similar to that set for the Sandspit Marina capital dredging if a risk is identified. Apart from this issue, Auckland Council expressed general support for the pre-dredging characterisation process.

Monitoring: An explanation of the proposed monitoring was undertaken. It is understood that Auckland Council was generally supportive but sought the ability for monitoring to be flexible so it could be modified in the future.

Chemical levels: An explanation was provided on the chemical levels and the need for elutriate testing and this has been further clarified in the updated Bioresearches Report.

The recommendation of the 1-hour separation between disposal periods was supported by Auckland Council who seek this as a consent condition.

The applicant undertook consultation directly with representatives of the Ngati Rehua Trust, Ngati Manuhiri Kaitiaki Charitable Trust, Ngati Wai Trust Board and Ngai Tai Ki Tamaki Trust. From previous projects, the applicant has existing relationships with Ngati Manuhiri, Ngati Wai and Ngai Tai Ki Tamaki. A meeting was held on the 8th November 2017 with representatives of Ngati Rehua and Ngati Manuhiri and meetings were held in August and December 2017 with Ngati Wai. A phone discussion on the proposal was held with Ngai Tai in late 2017.

After receipt of their report (included in Appendix Ten) a meeting was held with the Ngāti Whanaunga representative (Mr Gavin Anderson) on the 21st of March 2018. A key concern addressed was the need to feedback monitoring data and to ensure consultation was on-going during the disposal period and there was ability for on-going feedback based on monitoring outcomes.

An issue which has been raised during consultation is the possible process to involve iwi in the assessment of on-going monitoring results. This would provide the opportunity for on-going effects arising from the proposal to be considered by iwi and an opportunity to provide feedback and recommendations back to the permit holder and the EPA.

This reflects an issue which the applicant has identified during the implementation of the current consent, where the iwi consultation loop has not been continued through the ability to obtain feedback on the on-going monitoring which has been undertaken under the current consent.

A related issue has arisen since the EPA in recent times has required 90+ iwi representatives to be notified by the applicant prior to any monitoring. Although response levels have been very low, a number of iwi were wanting information on the original AEE, the consent and monitoring results. If it is the intent of EPA that notification of 90+ iwi representatives is to be undertaken prior to all future monitoring then there needs to be a system in place where iwi can easily access background information including previous monitoring results so they can determine if they have an interest in the monitoring and to understand the proposal as a whole.

To address these different but related issues, the applicant has proposed the following:

- 1 That this application documentation (plus any further information provided), the granted marine dumping permit, EPA audit results and monitoring results (and any iwi feedback/recommendations on the monitoring results) are retained on an electronic portal which parties can be referred to. The link to this material can then be provided to all iwi representatives who are being consulted so they can access any information they require.
- 2 The post-disposal monitoring results (after every 250,000 m³ +/- 50,000 m³ monitoring) are to be provided to the Ngati Rehua Trust, the Ngai Tai Ki Tamaki Trust, the Ngati Wai Trust Board, the Manuhiri Kaitiaki Charitable Trust and Ngāti Whanaunga (or their successors) within four months of the event that triggered the monitoring. This is the same time-frame for which the results are to be provided to the EPA and it is therefore expected in practice that the monitoring results will be submitted to the iwi representatives at the same time they are submitted to the EPA.
- 3 At the time of distribution of the above monitoring, the permit holder will invite the five iwi representatives to a tele-workshop (for example, Skype conferencing or similar owing to the geographical distribution of the various parties involved) within one month of the distribution of the results to outline the findings of the monitoring (and the cumulative outcomes of monitoring) and to seek feedback and any recommendations.
- 4 Any feedback received from the iwi representatives will be forwarded to EPA within one month being received and may provide comments from the permit holder addressing any specific issues raised in the feedback.

The above recommendations have not been incorporated into the consent conditions but can be offered (either in this form or modified to reflect any feedback) after the close of submissions and feedback from the relevant iwi has been obtained.

10.4 Ongoing Consultation

The NZDF will continue to be notified prior to any disposal periods or at an alternative timeframe agreed to with NZDF.

11. Conclusion

In 2013 Coastal Resources Ltd (CRL) was granted a Dumping Permit from Maritime New Zealand (MNZ) for the disposal of 50,000 m³ per annum of dredged material (from various Auckland marinas) at a new deep-sea spoil disposal site east of Great Barrier Island (now referred to as the "Northern Disposal Area" (NDA)) (a 1,500 m radius circle centred on 36° 12.3403"S and 175° 48.002 "E (WGS84 datum)).

This Permit has subsequently had a number of variations and owing to legislative changes is now administered by the Environmental Protection Authority (EPA). The current Marine Consent EEZ900012 expires on the 31st of December 2032. To date, over 400 trips to the NDA have been undertaken under this consent with approximately 199,800 m³ of dredged spoil disposed (as at 1 April 2018). Disposal material has come from Pine Harbour Marina, Half Moon Bay Marina, Sandspit Marina, Whitianga Marina, Hobsonville Marina and Hobsonville Point.

It is now becoming apparent that the NDA will be the main site for the disposal of dredged spoil from the Auckland Region and possibly from parts of the Waikato Region in the future.

CRL is therefore applying for a marine disposal consent to continue offshore disposal of dredged sediment at the NDA and increasing the annual disposal limit to 250,000 m³/year (approximately 560 barge loads). The existing consent will be surrendered upon the new consent being given effect to.

CRL engaged Beca to undertake a desktop assessment of the existing environment and the expected oceanographic effects of disposal of dredged sediment at the NDA. Bioresearches was engaged to undertake an assessment of water and sediment chemistry and ecology, based largely on the monitoring undertaken to date. Property Economics was commissioned to undertake the supporting Economic Assessment.

Substantial investigations, a pilot disposal and monitoring trial in 2010 and analysis of the NDA site were undertaken for the previous consent application. This work, together with an assessment of regular disposal monitoring undertaken between 2011 and 2016 and results of a review of international literature on deep-water disposal sites, has been used as the basis for Bioresearches and Beca Assessments.

The material disposed of at the site to-date has predominantly been from marinas. After approval by EPA as a source site, sediment is generally loaded onto a bottom-dump barge from source by digger. The dredged sediment is then transported to the NDA via bottom-dump barges, either self-propelled or towed by tugs.

The tug/barge skipper is required to check for marine mammals for 30 minutes prior to disposal and record the date, time and GPS coordinates of both the start of the mammal monitoring and disposal. Unloading is then achieved by the automatic opening of the barge floor (while the barge remains in motion over the disposal spot at a rate of 4-7 knots depending on weather conditions) and the disposal from the barge is achieved in 1-2 minutes. The barge is then closed and proceeds back to Auckland.

To date, disposal has been at one location within the disposal area (ie the centre of the disposal area). It is proposed to maintain a 100 m target radius around a disposal point but vary over time the location of the disposal point within the disposal area after every 250,000 m³ ± 1,000 m³ cumulative volumes to ensure that the material is dispersed more evenly within the disposal site.

Disposal of 250,000 m³ of dredged sediment per year equates to approximately 560 barge loads to the disposal site (as opposed to the approximately 100-130 barge loads for 50,000 m³ per annum).

The short-term fate of dredged material immediately after disposal depends on the composition of the material and water depth at the disposal site. Studies have found that 95 to 99 percent of the material descends quickly through the water column at a constant rate. Once the material reaches the bottom the largest particles settle in a narrowly defined central mound, while finer components, such as silt, may spread over a larger area around the impact area, forming a layer of fluid mud. Field surveys undertaken at the NDA have indicated that the overall main component of the deposited material rapidly descends through the water column with a fall velocity of around 0.6 ms⁻¹.

The disposal mound is slowly developing and increasing in thickness over time. The survey data appears to indicate that the present mound is elongated in the south-west to north-east direction over a length of around 460 m. There appear to be two peaks of material which may be attributed to the location of the barges during deposition and oval mound shape is likely to be the result of the direction of barge approach. The average mound side slope is between 1 in 75 and 1 in 50.

After reviewing the available information there continues to be no evidence of deposited material beyond 250 m from the centre of the disposal site, well within the 1500 m radius boundary of the disposal site. This continues to support the original assessment of impacts, and the non-dispersive classification for the NDA.

Provided the method of disposal (including barge capacity), sediment type and environmental constraints remain constant the short-term plume effects associated with the disposal of dredged sediment will continue to be contained well within the disposal site. While the duration of elevated turbidity levels from the disposal plume are estimated to increase to some 1000 hours per year, this is considered a less than minor effect because of the low level of effects other than at the immediate point of disposal, and the relatively limited area (less than 0.2%) of north-eastern regional continental shelf affected overall.

Long term physical effects are predominantly associated with the continued growth of the disposal mound. The disposal mound is not anticipated to result in any significant adverse oceanographic impacts i.e. on waves and currents.

Based on the elutriation testing conducted pre-dredging contaminants are not likely to be released into the water column at the disposal site at concentrations high enough to cause adverse effects to biota.

The monitoring of the benthic biota at the disposal centre site has shown benthic fauna at the disposal centre site have been affected by the disposal operations, with significant mortality of individuals inhabiting the sediments, most likely as a result of smothering and insufficient recolonization time between successive disposal events. Likewise, the individuals inhabiting the dredged sediments have not survived at the disposal site, most likely due to the change in depth and physical disturbance of dredging and then being buried in the barge of dredge material with limited water space if any.

The geographical extent of the high mortality is not known but is limited to less than 500 m from the disposal central site as significant decreases in abundance of biota were not detected at the 500 m sites. Based on the information available from sea bed cores and bathometric studies, the footprint of the disposal mound is elongated west to east and located within approximately 375 m east and west of the disposal area centre and 250 m north and south.

The ongoing disposal at the NDA will result in a gradation of effects radiating away from the disposal point out to and beyond the influence of disposal material. The effects will depend on the frequency, thickness of deposits, the biota present and their abilities to survive burial by sediments. The effects will therefore be different for different species. The result for a stable disposal volume and frequency will be an equilibrium of limited species and numbers in the centre, with a changing species composition and abundance with distance from the centre, finally becoming no different from the background biota.

Given the nature of the activity and its location, no potential significant risk to fin fish, mammals or birds have been identified.

Likewise, no potential effects on recreation activities have been identified and there will be nil or negligible visual and landscape effects and effects on human health.

A Consultation Information Pack was sent to a range of parties who may have an interest in the area (including various iwi representatives). Representatives of Ngati Rehua Trust, Ngati Manuhiri Charitable Trust, Ngaati Whanaunga Incorporated Society and Ngai Tai Ki Tamaki Trust requested further consultation and this was subsequently undertaken along with consultation with the Ngati Wai Trust Board. Various recommendations have been made in this report to make information more available to interested iwi and to provide results form and receive feedback on the on-going monitoring.

The Ministry for Primary Industries provided some comments which have been addressed in the final assessments and this application. Auckland Council was further consulted and a number of their questions were answered through this process.

A range of consent conditions have been proposed which largely reflect the existing consent conditions but modified as appropriate to reflect lessons learnt during the implementation of the current consent. The key change is that instead of a single disposal point within the disposal area, disposal will now occur over a grid-pattern to spread out the disposal mound.

Overall, no significant adverse effects are arising from the current disposal activity at NDA or have been identified in terms of the proposed increase in the annual volume of dredged material which could be disposed of at the site if the new marine dumping consent is granted.

It is considered that there are no practical options to re-use, recycle or treat the dredged sediment and therefore the application cannot be declined in terms of s62(1A)(a).

Given that the application is for the continuation of an existing activity (*albeit* at a higher per annum volume) which was subject to an initial five-year consenting process between 2007 and 2012, a trial disposal period which was monitored and monitoring under the current consent since 2013, it is considered there are no reasons why the potential effects on human health or environment cannot be assessed. Therefore the application cannot be declined in terms of s62(1A)(b).

No reasons or alternative options have been identified which may result in the proposal not being the best approach for the disposal of marine sediments. Therefore the application cannot be declined in terms of s62(1A)(c).

In our opinion, granting consent would not be contrary to the purpose of the Act (s10 of the EEZ). The on-going disposal of dredged material has a very localised adverse effect (which is contained within the disposal area) and does not impact on the sustainable management of the natural resources of the EEZ or the continental shelf.

Granting consent under S62 with the recommended conditions outlined in Section Nine of this report (and which can be imposed in terms of s63 of the EEZ) will ensure that the adverse effects on the environment from the discharge will be both localised and minimal.

12. Study Team

David Hay (Osbornehay)

David Hay MSc(Hons), MNZPI is a Planning Consultant and Director of Osborne Hay (North) Ltd.

After graduating from the University of Waikato, David commenced his career as a Planner in 1991 with Works Consultancy Services Ltd before joining Manukau Consultants Ltd as a Senior Planner in 1996. In 2000, GHD Limited purchased Manukau Consultants Ltd and in 2004 David was appointed as the Principal Planner and in 2006 as an Office Manager. In 2007 David established Osbornehay with Greg Osborne.

Since 1991 David has acted as the planning consultant for a wide range of network utility, local authority, Crown and private developments. In this role he has experience in site selection analysis, consultation, preparation of notices of requirements and resource consent applications and attendance at Council Hearings and the Environment Court. In terms of coastal projects, David coordinated and prepared the applications for the original NDA marine dumping permits, is the Planning Consultant for Gulf Harbour, Half Moon Bay, Bucklands Beach Yacht Club and the Outboard Boating Club marinas in Auckland and was formerly the Planning Consultant for Pine Harbour Marina (until its recent sale). David has also been the planning consultant for various infrastructure projects within the coastal marine area and environment, and most recently was the planning consultant responsible for obtaining resource consent for the lighting up of the Auckland Harbour Bridge.

Jennifer Hart (Beca)

Jennifer Hart, BE (Hons) Civil Engineering, ME Coastal Engineering Specialisation, MEng Port and Coastal Engineering, is a technical director in Beca's Coastal and Marine team.

Jennifer has over twenty years' experience in port and coastal engineering in New Zealand, the Pacific and the United Kingdom. She has been responsible for all stages of the marine infrastructure life cycle, including high level strategies, investigation and concept design, environmental impact assessment, risk management, design, procurement, construction, asset management and maintenance. Her projects have ranged from port and harbour facilities such as jetties, wharves, dredged channels, reclamations and breakwaters to sea defences such as beach replenishment, seawalls and groynes.

Will Ingle (Beca)

Will Ingle, BEng (Hons), IEng MICE is a Senior Civil Engineer in Beca's Coastal and Marine team.

Will has over nine years' experience working for multidisciplinary engineering consultancies and has worked on a wide variety of maritime, infrastructure and building projects. He has experience working on projects during various stages of the project lifecycle and has been involved in a number of feasibility studies for new port and coastal projects in New Zealand and South East Asia. In his role Will has worked closely with Coastal Scientists and Engineers, Ecologists and various stakeholder groups to assess the impact of development. Clients have included private developers, local authorities and government agencies.

Simon West (Bioresearches)

Simon West MSc (Hons) (Marine Zoology), BSc (Biology & Earth Science), is a Marine ecology Consultant at Bioresearches.

Simon gained his BSc from the University of Waikato in 1989 and joined Bioresearches after completing his MSc at the University of Auckland in 1991. In 2015, Babbage Consultants Limited purchased Bioresearches.

Since 1991 Simon has acted as a marine ecological consultant for a wide range of network utility, local authority, Crown, industries and private developments. In this roll he has experience in coastal and estuarine marine ecology throughout New Zealand, shellfish contamination, sediment contamination, ecological impact assessment and presentation of expert witness evidence at Council Hearings and the

Environment Court. Simon has conducted long term marine monitoring studies for Marsden Cove, Pauanui and Whitianga Waterways, New Zealand Steel, Watercare's Mangere wastewater treatment plant, at Ravensdown fertiliser manufacturing plants in Napier and Dunedin. He has also conducted assessment of effects assessments for marine projects and activities including ecological impacts of proposed marinas, environmental effects of an aluminium smelter, steel mill, oil refinery, underwater demolition training, industrial discharges, wastewater and stormwater discharges and submarine cables. Recently Simon has conducted pre dredging sediment and biota characterisation of a number of marinas and the monitoring of the deep sea dredge disposal site.

Phil Osborne (Property Economics) (Senior Economist)

Philip holds a MCom and MPlan and is near the completion of his doctoral thesis in Developmental Economics.

Philip has over 18 years experience in business analytics and economic development, both in New Zealand and internationally. He has been extensively involved in both public and private consultation for econometric modelling, retail, residential and business land market assessments and economic cost-benefit analysis. Over this period Philip has also lectured at key Australasian Universities and has consulted to the United Nations Advisory Group for Economic Development. This background allows Philip to bring an incisive perspective to any strategic project, providing economically grounded solutions to planning and property market issues. Phil has recently provided economic evidence for government agencies on major infrastructure projects including Ruakura Logistics Hub in Hamilton and the East West Alliance in Auckland.

Phil has extensive experience in presenting economic evidence in Board of Inquiry, Environment Court and Council Hearings for both private and public sector interests.

Appendix One

The Existing Marine Dumping Permit

Appendix Three

Site Location and Proposed Disposal Points Plans

Appendix Four

**Northern Disposal Area - Physical Oceanography
Assessment**

Appendix Five

Assessment of Source Material, Ecological and Sediment Quality Effects and Disposal

Appendix Six

**Economic Assessment of Deep Sea Dredging
Disposal in Auckland**

Appendix Seven

2010 Assessment of Alternative Sites

Appendix Eight

EPA Correspondence

Appendix Nine

Approved Whale Observation Methodology

Appendix Ten

Consultation Communication and Responses

Report Prepared By:
David Hay

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Osborne Hay (North) Limited Phone: 09 425-9844
PO Box 16 Mobile: 027 425-0234
Warkworth 0941

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