BEFORE FAR NORTH DISTRICT COUNCIL AND NORTHLAND REGIONAL COUNCIL

IN THE MATTER	of the Resource Management Act 1991 ("RMA")
AND	
IN THE MATTER	of an application for regional and district resource consents to extend the hardstand area immediately adjoining the southern extremities of Bay of Islands Boatyard, Opua (legally described as Lot 1 DP 199153) (NRC: APP.040976.01.01) (FNDC: RC2200220)
APPLICANT	Far North Holdings Limited

STATEMENT OF EVIDENCE OF PAMELA KANE-SANDERSON

(ECOLOGY AND WATER QUALITY) ON BEHALF OF FAR NORTH HOLDINGS LIMITED

20 November 2020

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1 INTRODUCTION

Qualifications and experience

1.1 My name is Pamela Lauren Kane-Sanderson.

1.2 I have the qualifications of Bachelor of Science in Zoology and Statistics and a Post Graduate Diploma, Awarded with Distinction in Marine Science from the University of Otago. I graduated in 2004. I completed a Master of Science in Marine Science with First Class Honours at the University of Auckland in 2015. I am an Ecology Consultant specialising in marine ecology with the consulting firm 4Sight Consulting and have been in this role for over five years.

Code of conduct

1.3 I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note (2014) and I agree to comply with it. I confirm that this evidence is written within my expertise, except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Scope of evidence

1.4 My evidence should be read in conjunction with the *'Ashbys Boatyard Maritime Servicing Area for Far North Holdings Ltd, Assessment of Ecological Effects, September 2019'* and is structured as follows:

(i) Investigations/reporting completed.
(ii) Summary of assessment of ecological and water quality effects: conclusions.
(iii) Comments on the s42A Report.
(iv) Comments on matters raised in submissions.
(v) Recommendations for conditions.
(vi) **Addendum 1** – My response to the Biosecurity NZ submission.

2 EXECUTIVE SUMMARY

2.1 Overall, it is my opinion that the proposal's ecological and water quality effects will be no more than minor. The s42A Report analysis comes to a similar view.

3 INVESTIGATIONS/REPORTING COMPLETED

3.1 4Sight Consulting was engaged in October 2018 to advise on the ecological and water quality aspects of the construction of the maritime servicing area application. I, along with Mr Oliver Bone of 4Sight Consulting, undertook the field work for the project on 16 May 2019. An assessment of ecological effects report was prepared in September 2019 and submitted in technical support to the application.

3.2 I confirm that the assessment of ecological effects report comprises of work undertaken by me or under my supervision and that the analysis, recommendations and conclusions are comprised in my detailed evidence on the application.

4 SUMMARY OF ASSESSMENT OF ECOLOGICAL AND WATER QUALITY EFFECTS: CONCLUSIONS

Vegetation

4.1 Vegetation removal occurs at the southern end of the site and consists of low value scrub. An ecological assessment of this area was undertaken by Northland Ecology, which I accept and conclude that botanical effect of removal of this vegetation is less than minor.

4.2 Removal of vegetation on the reclamation side of the existing cycle trail, will involve mainly native shrubs and trees, including a large Pohutukawa. The loss of this vegetation, particularly the Pohutukawa, may have a landscape/natural character context but its ecological significance in my opinion is small and minor. The loss of the shrubs and small trees could be offset by enhancement plantings elsewhere around the site as well as removal of pest weeds.

4.3 There will be a loss of a small area containing scattered small/juvenile mangrove. This is not a significant ecological effect. Seen relative to the extensive mangrove habitat present nearby in the Kawakawa River estuary the effect is less than minor.

Intertidal Habitat and Values

4.4 There is no significant intertidal habitat or biota such as seagrass or edible shellfish beds (such as cockles, pipi or oysters) within the site of the reclamation and construction works. Intertidal marine ecological effects will be minor.

4.5 No significant intertidal bird feeding areas will be affected. Impacts on shorebirds will be minor.

Subtidal Habitat and Values

4.6 The subtidal biota is typical of that documented elsewhere in the area and is dominated by common types of invertebrate marine life including polychaetes and crustacea.

4.7 The ecological significance of the dredging and construction effects on subtidal biota is minimal. Effects should be naturally remediated in a short period of time by natural recruitment and recolonisation of the newly exposed seabed which will be of a similar texture to that which presently exists. Overall, the effects of the dredging will be minor.

4.8 Although maintenance dredging, if required, will repeat the cycle or biological loss and recovery, the ecological effect and significance of any ongoing need for maintenance dredging is very low.

4.9 My sampling has shown that sediments to be dredged are not polluted with most heavy metals analysed when compared to currently accepted sediment quality guidelines. Specifically, cadmium, chromium, lead, nickel and zinc concentrations in sediments sit below, and therefore meet, the Proposed Northland Regional Plan (PNRP)[1] coastal sediment quality guidelines. These are conservative threshold effect levels (TEL) developed by MacDonald *et al*. (1996)[2]. There is no significant risk of pollutant releases of these metals as a consequence of the dredging.

4.10 However, at three of the sediment sampling sites, copper was above these coastal sediment quality guidelines for Northland. As I have noted above, the PNRP

[1] Northland Regional Council. Proposed Regional Plan – Appeals Version, June 2020. Online version incorporating all Plan Changes up to June 2020.

[2] MacDonald, D.D., Carr, R.S., Calder, F.D., Long, E.R. and Ingersoll, C.G. (1996). Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5:253-278.

threshold for copper is a conservative guideline and in my experience is unlikely to be met in urbanised settings or in areas of high marine activity such as mooring areas and near vessel maintenance facilities where there is a high use of copper based antifoulants.

4.11 The copper elevation above the PNRP sediment value, in my opinion is not unexpected at this locality and is likely to reflect the proximity of the site to past and potentially also present influences, including potentially from the current boatyard.

4.12 The copper results remain well below the Australia and New Zealand Environment and Conservation Council (ANZECC)[3] default guideline values (DGVs). The DGV's are still concentration values below which the probability of toxicological effects is low.

4.13 Arsenic was slightly elevated at sediment site 1, which is closest to the current boatyard/marina area. Here it was slightly higher than ANZECC DGV. At the other sediment sites, arsenic concentrations fell between the TEL and DGV value. The levels of arsenic may be partly attributable to leaching from marine timbers treated with arsenical compounds. Overall, I still consider arsenic values to be low.

4.14 Tributyltin (TBT) was found at slightly elevated levels at sediment sites 1 and 4 compared to ANZECC DGV. TBT has not been used or manufactured in New Zealand for about two decades. Its toxicity to non-target marine organisms, lead to it being regulated against in New Zealand. The TBT found in the sediment sampling is probably a residual signature of its historical use.

4.15 No special fish values have been identified at the site. Movement of estuarine fish and migratory native freshwater fish will not be impeded.

Water Quality Effects

4.16 The waters of this part of the Kawakawa River estuary are classified in the PNRP as 'Tidal Creek' under the Coastal Water Quality Management Units. These coastal water quality standards are for ecosystem health, contact recreation and shellfish

[3] ANZECC (2018) Australian and New Zealand guidelines for fresh and marine water quality, August 2018. National Water Quality Management Strategy, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra, Australia.

consumption and they apply after allowing for reasonable mixing and need to be maintained in relation to any discharges.

4.17 Dredging carries the main potential for water quality effect for this proposal. Dredging of 600m^3 is a comparatively low volume and would most likely be completed over a few days. On that basis, any localised effects will be minor and short-term.

4.18 In light of the localised small-scale elevation in copper, arsenic and TBT in sediments, an assessment was made of the risk of generating contaminants during the dredging process. To do this, elutriate tests were carried out. Elutriate tests investigate what is likely to happen when sediments are removed from the seabed and exposed to aerated seawater. The laboratory elutriate test measures the resulting concentration of the target metals in their dissolved form in the water. It effectively simulates what happens during dredging as sediment is disturbed and lost to the water column during excavation.

4.19 The elutriate tests showed that the concentrations of the dissolved metals were below (met) the required thresholds in the applicable water quality management unit under the PNRP. From this, it can be concluded that there is no significant water quality risk from mobilised metals entering the water column during dredging.

4.20 In my opinion the current water quality and sediment texture and quality are likely to reflect, and continue to be maintained by, the dominating influence of the Taumarere (Kawakawa) River and the daily flushing that occurs in response to tidal patterns and riverine outflows.

4.21 The dredging process may generate localised turbidity and suspend sediment in the water column, some of which might resettle nearby. However, the dredging method (hydraulic grab) typically retains most material removed and disturbs relatively little material beyond the dredge bucket. It is a common method of dredging in shallow waters and has been used widely in Northland without any history of significant water quality problems so far as I am aware.

4.22 While there is small potential for the reclamation construction to generate localised turbidity, any turbidity or sedimentation effects on habitats and biota beyond the reclamation and construction works area will be minor and localised.

4.23 There will be no adverse effects on water quality arising from the stormwater discharges from the reclamation once it is operational. Activities on the reclamation will not involve or result in the generation of significant contaminants and runoff will be captured and treated through proprietary devices to remove most sediment and adsorbed metals before discharge.

4.24 Overall, I have concluded that marine water quality effects as a result of the proposal will be highly localised and short term. Such effects will be confined to the works period and will not undermine/exceed the Coastal Water Quality Management Units for the area beyond the works period. Localised turbidity can be further confined by the use of a geotextile boom around the works area if required.

5 COMMENTS ON S42A REPORT

5.1 The s42A Report does not raise any significant points of difference or further issues and is consistent with the findings of the 4Sight ecology and water quality report. I agree with the findings in the s42A Report.

5.2 Specifically, the following paragraphs of the s42A Report:

- paragraph 115 (page 34), which states '*Based on the above assessment, it is considered that the effects arising from the proposal as set out in the information provided will generally be minor or less than minor*.'
- paragraph 127 (page 36) which states, '*…the proposal will have minimal effects on ecological processes and water quality as there are no representative or significant natural ecosystem or site of biological importance that may be affected by the proposal.'*
- paragraph 61 (page 24) which states, '*The conclusion is that any adverse effects on water and sediment quality will be minor.*'
- paragraph 114 (page 34) which states '*The matter of water quality and any incremental effects that the proposal may have are largely avoided by the*

proposed implementation of suitable water treatment prior to discharge into the CMA.'

5.3 Paragraphs 62 to 64 of the s42A Report (page 24) comment on biosecurity with specific reference to *Sabella Spallanzani* (Mediterranean Fanworm). I agree with the Report recommendation (paragraph 64, page 24) that a Biosecurity Management Plan (BMP) should be prepared and that this can be covered by an appropriate condition of consent, as has been provided in the Northland Regional Council recommended conditions (refer Condition 13(d), page 84)

5.4 I provide additional comments relating to biosecurity and to the submission by MPI in Addendum 1 to this statement.

6 COMMENTS ON MATTERS RAISED IN SUBMISSIONS

6.1 I have reviewed the s42A Report summary of Submissions. In most cases, submitters raised similar issues in terms of ecology which have been dealt with in the 4Sight reporting and this statement of evidence.

6.2 I wish to make further brief comments regarding ecological points raised in submissions. This is in respect of:

- Bird/plant life.
- Animals including marine mammals.
- Mahinga kai.
- Mangrove removal.
- Loss of trees including a large Pohutukawa.
- Water pollution/degradation.
- Discharges and stormwater.
- Seepage into the sea during reclaiming land.
- Pollution.
- Biosecurity.

6.3 E Kennedy raises the issue of '*The effect on bird and plant life*' and R Cooke raises the issue that '*This foreshore is habitat to white-faced herons already displaced by industrial activity from the vicinity of Ashby's. The ecological report misses this as it*

does the successful shore-based fishing from this site'. Neither effects on birds nor plant life is significant in my view.

6.4 In relation to R Cooke's comment, I acknowledge there is a small area of tidal flat that offers potential feeding habitat for birds, including perhaps white-faced heron. No birds were seen feeding, roosting or nesting at the site during my survey and the specific location is not recorded as important for birds so far as I am aware. There is extensive similar habitat available to bird species in this region of the Kawakawa River estuary. As I have concluded in Point 4.5 of this evidence, no significant intertidal bird feeding areas will be affected and impacts on shorebirds will in my opinion be minor. Effects on plant life are discussed in Points 4.1 to 4.3 and further below in Points 6.7 to 6.8.

6.5 J Halliday raises the issue of '*There has been no thought given to animals and marine mammals regarding the effect this will have on the eco-system*'. I have covered my views on the minor nature of effects on marine invertebrates, fish and birds in my reporting and in this statement. In regard to marine mammals, and notwithstanding the PNRP mapping layer that denotes the entire Northland region as a 'Significant Marine Mammal and Seabird Area', there is no marine mammal presence likely within the site or affected by the proposed works.

6.6 The Waikare Inlet Taiapure Committee state '*We oppose this application on the grounds that it would have a major impact on our rohe moana, by degrading water quality, our mahinga kai would be buried, our history would be buried*.'

6.7 I understand the broader scope of this submission and that Mahinga Kai extends beyond the particular kai moana. In so far as I can comment on this, my ecology findings in this context confirms that at this site the intertidal habitat which will be reclaimed is limited and heavily silted. Pacific oysters (*Crassostrea gigas*), which in ecological terms is an invasive exotic species, is the only obvious potentially edible species. At this location these oysters were limited, and, in my experience, it would be an unlikely area to be targeted for food collection.

6.8 R Young raises concerns regarding mangrove removal. As I have noted, a few small/juvenile mangroves will be removed. These offer minimal habitat and are not significant relative to the extensive mangrove habitat present in the Kawakawa River estuary.

6.9 Five submitters (K Taylor, P Beck, R Cooke, B Drey and C Matthews) raise the issue of the loss of trees including a large Pohutukawa. I have dealt with this in Point 4.2 of this statement.

6.10 Four submitters (P Cooke, R Young, C Matthews and Waikare Inlet Taiapure Committee) raised the issue of water pollution/degradation. R Young states '*Not enough research into effects of reclamation on water health and water flow*' and C Matthews states '…*further degrade of water quality at entrance Kawakawa River*'. Water quality has been discussed within my report in Points 4.16 to 4.24.

In summary:

i) There is very low and short-term risk for contaminants to be mobilised during dredging, disposal of dredged material to the reclamation, and in the decant/stormwater discharge from the reclamation area, at concentrations that pose a water quality risk.

ii) There is a very low potential for the reclamation construction to generate unacceptable levels of turbidity beyond the site or cause potentially smothering sedimentation.

iii) In my opinion, overall, these potential sources of disturbance offer a minor impact on local water quality which is likely to continue to be governed by and to reflect, the flushing that occurs in response to daily tidal patterns and riverine outflows.

6.11 R Young and R Cooke raise the issue of discharges and stormwater. R Cooke states '*Stormwater discharge from an industrial worksite creates the possibility of contamination up and down the river. This has already happened with high concentrations of copper detected around Ashby's. Heavy industry – even light marine industry is not an appropriate activity in this estuarine site where tidal flushing to open sea is almost non-existent.*' Stormwater management within the proposed development is designed to treat stormwater flows through proprietary devices which reflect current industry best practice, reduce scour and ensure compliance with PNRP rules such as the coastal water quality standards.

6.12 E Kennedy raises the issue of '*Seepage into the sea during reclaiming land*' and K Young raises the issue of '*Risk of soil/clay other discharges into river*'. I understand, and it is my experience, that losses through the reclamation do not occur because the construction methodology uses geotextile cloth to retain fine material within the reclamation.

6.13 E Kennedy and P Beck make a general reference to pollution. I have discussed pollutant sources, the small water quality risk, and how such risk can be mitigated through specific management considerations (e.g., minimal dredging time), natural resilience (e.g., tidal and riverine flushing) and interventions (e.g., stormwater devices).

6.14 The Ministry for Primary Industries identifies potential risks it sees as associated with *Sabella Spallanzanii* (Mediterranean Fanworm) at this locality. I provide additional comments on the MPI submission in Addendum 1.

6.15 In my opinion, the concerns expressed by submitters have been dealt with and can be allayed in terms of the small scale and lack of significance of ecological and water quality effects associated with the proposal.

7 RECOMMENDATIONS FOR CONDITIONS

7.1 In the event that a decision is made to grant the application, I recommend the following matters are addressed in conditions:

(i) Removal of native vegetation could be offset by enhancement plantings elsewhere (where possible) around the site as well as removal of pest weeds.

(ii) Localised turbidity could be further confined by the option to use a geotextile boom around the works area if required.

(iii) Biosecurity, and in particular *Sabella Spallanzanii* (Mediterranean Fanworm) management by way of a Biosecurity Management Plan.

Pamela Kane-Sanderson
20 November 2020

ADDENDUM 1 – MY RESPONSE TO THE BIOSECURITY NZ SUBMISSION

1. By way of background, biosecurity was not specifically covered in our reporting as we understood that it was a matter being dealt with by the client as part of its participation in the existing comprehensive local protocols targeted at *Sabella Spallanzanii* (Mediterranean Fanworm (fanworms) management. Also, we understand there was no specific request from Northland Regional Council for biosecurity information, which might have been brought to our attention.

2. I have read the Biosecurity New Zealand (BNZ) submission with reference to Unwanted Organisms (UO), specifically fanworms. It raises a number of issues which I comment on below.

   i. I agree with BNZ that fanworm is an important biosecurity issue which needs to be specifically addressed by way of a Biosecurity Management Plan (BMP).

   ii. That requirement has been recognised in paragraph 64 of the s42A report (page 24) which recognises the need for a consent condition requiring a BMP and is reflected in the NRC recommended condition 13(d) which states as follows:

   '*A Biosecurity Management Plan (BMP) prepared by a suitably qualified and experienced person that details the measures required prior to, during, and on completion of all constructions works. The BMP is to be prepared generally in accordance with the Council's Marine Pathway Management Plan and is to address the potential for pathways for any pest organisms to be introduced, prevention and monitoring measures, and response should any organism be identified during or after the construction period*.'

   iii. BNZ state: *The response operations work is mainly carried out by divers undertaking careful removal of individual fanworms. This method of removal is required to prevent fragments of fanworms remaining, as these can regrow into new individuals*.

   My Response: The area could be checked for fanworm by divers before the works start.

   iv. BNZ state: *The dredging activities will create numerous risks for the response including; fragmenting any Sabella still remaining in the area by dredging*

operations, increasing difficulty of removal by divers in the future; and exacerbating spread of Sabella by disturbance of the seabed.

My Response: There is an existing risk associated with the area regarding disturbance of the seabed. For example, disturbance to the seabed can presently occur from propeller wash of boats accessing the area and mooring chains dragging across the seabed. The strong riverine outflow which can occur in the area may also at times mobilise the seabed. If the seabed area is checked by divers before dredging, the risk should be minimal and mitigated and will therefore be no greater than what currently exists.

v. BNZ state: *Potential transfer of Sabella via dredging spoil (if not used as directly adjacent fill on land).*

My Response: I understand that the dredged material will be used on adjacent land as fill.

vi. BNZ state: *Potential transfer of Sabella associated with barges/other vessels and equipment used in the proposed works if these have not been recently antifouled and decontaminated*.

My Response: I understand that all vessels and marine equipment used will be local and pose no change in risk profile. There are existing protocols around antifouling certification, marine pest free status etc. which will have to be met by the contractor as is current practice.

vii. BNZ state: *Dredging may exacerbate the ability of Sabella and other invasive species to recolonise as more space becomes readily available for occupation from disturbance*.

My Response: I am not quite sure I understand the issue being raised. The dredged area of seabed will still be the same or similar in square metre dimension but at a slightly greater depth. Therefore, there should be no change in risk regarding seabed area per se. There will be more structures, and these have more potential to host Sabella in the future. These structures will need to be incorporated into the Sabella surveillance undertaken by the biosecurity monitoring effort.

viii. BNZ state: *The subtidal biota results provided in the assessment of ecological effects shows that nine samples were taken at depths ranging from 1.5m-*

3.0m. The results mention species of interest such as Theora lubrica but no assessment of marine pests including UO's.

My Response: None of the grab sampling (and dredge haul) I undertook in this small area recorded fanworm or other pest marine species. If they had, we would have recorded them in our reporting and discussed their significance or otherwise.

ix. BNZ state: *BNZ and NRC plan to continue surveillance and removal of Sabella from the marina as there has been a dramatic drop in densities. We believe it is highly likely that more Sabella, albeit in reduced numbers, remain within the footprint of the proposed dredging area*.

My Response: If BNZ believe there is Sabella within the footprint of the proposed dredging area, this area can be targeted for surveillance by the biosecurity diver effort. Our field investigation did not record any.

Such risk, if any, within the proposed dredging area, would seem small relative to that posed by the area in general. If there is currently ongoing and persistent reinfestation within the marina albeit at reduced levels, there is most likely reproductively active Sabella somewhere that are not captured by the existing surveillance programme. That would seem at face value to be quite likely given the extensive seabed and many swing moorings, chains, buoys, and vessels in the vicinity. I am not sure what biosecurity effort is directed at these potential refuges for Sabella.

x. BNZ state: *In addition, the operational works, including the capital dredging and movement of barges/other work vessels and equipment, may impact the ability of divers to conduct survey work for both agencies*.

My Response: The dredging can occur over a short period that need not disrupt diver based biosecurity work.

xi. BNZ state: *BNZ's Marine High Risk Site Surveillance Programme (MHRSS) may be disrupted by the proposed dredging activities, either directly by preventing dive surveys from being done adequately or by smothering sites that are part of the MHRSS*.

My Response: The dredging will occur over a short period, which I understand given the small volume of material to be dredged can be achieved over just a

few days. Turbidity and sediment changes should be localised and short term and negligible relative to the ambient range in this location. The surveillance programme need not be disrupted or compromised by the dredging.

xii. BNZ state: *There may be health risks to the divers as a result of contaminants released into the water or through disturbance of sediments posing a safety hazard by lowering the underwater visibility, which is known to be low already.*

My Response: There is no need for divers to be in the water concurrently with the dredging and any water quality related dredging effects will be minor and short term. I am unsure what contaminants are being referred to by BNZ, however as previously discussed metal levels are low and, in any effect, do not pose an occupational health risk. Water visibility will be affected again for a short period around the works site. This will not be an issue for divers if the activities are kept separated by a few tidal cycles.