### **BEFORE THE ENVIRONMENT COURT**

### AT AUCKLAND

### I TE KŌTI TAIAO O AOTEAROA

### KI TĀMAKI MAKAURAU

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### BETWEEN BOONHAM

(ENV-2021-AKL-000061)

MANGAWHAI MATTERS INCORPORATED & OTHERS

(ENV-2021-AKL-000062)

Appellants

AND KAIPARA DISTRICT COUNCIL

Respondent

## STATEMENT OF EVIDENCE OF SHANE KELLY ON BEHALF OF MANGAWHAI CENTRAL LIMITED

## (MARINE ECOLOGICAL VALUES AND POTENTIAL EFFECTS OF STORMWATER DISCHARGES)

17 December 2021

Counsel instructed: Ian Gordon Stout Street Chambers Level 6, Huddart Parker Building 1 Post Office Square Wellington 6011 Solicitors acting: JR Welsh / SJ Mutch ChanceryGreen 78 Jervois Road Auckland 1011



### INTRODUCTION

### **Qualifications and experience**

- 1. My name is Shane Kelly. I have a PhD in biological sciences, and over 25 years' experience studying and working in environmental and For instance, I spent 5 1/2 years as a Project marine science. Leader/Principal Advisor in Environmental Research and Monitoring at the Auckland Regional Council ("ARC"). In this capacity, I managed marine ecology, marine water quality, sediment contaminant, shellfish contaminant, and estuary monitoring programmes. I was also a senior technical advisor on major urban infrastructure programmes related to stormwater, wastewater and landuse management (which included acting as the environmental manager for the Regional Discharges Programme). While at the ARC, I also led the development of the Benthic Health Model (which was developed to assess the health of intertidal communities), and the development of the Waitemata Harbour and Pahurehure Stormwater Contaminant Accumulation Models.
- 2. In 2008 I established Coast and Catchment Ltd, and since that time have provided technical advice on the effects of numerous coastal and landuse activities including the effects of stormwater and wastewater discharges, dredging, mangrove removal and pollution spills. My work has also included: fisheries surveys; the assessment of environmental values and issues in a number of harbours and estuaries; acting as a hearing commissioner; and providing technical advice on aquaculture development and regulation. I was also commissioned to lead the production of four "State of the Hauraki Gulf" reports for the Hauraki Gulf Forum.
- 3. I have prepared environmental assessments for stormwater management covering much of Auckland's urban area and acted as a technical expert and advisor for Greater Wellington Regional Council, in relation to Wellington City Council's application for a city-wide stormwater discharge consent. I designed and report on the harbour monitoring programme for New Zealand's largest wastewater treatment plant at Mangere, and regularly advise other district, regional

and city councils around New Zealand on the coastal impacts of wastewater, urban stormwater and industrial discharges.

4. My involvement in Plan Change 78 ("PC78") has included providing expert advice on the marine ecological values of Mangawhai Harbour, and the potential effects of stormwater discharges (including during the bulk earthworks phase) on those values. I am familiar with the application site and the surrounding locality.

### **Code of Conduct**

5. 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. In that regard, 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

- 6. My evidence:
  - (a) provides an executive summary of my key conclusions;
  - (b) summarises potential effects of stormwater and sediment discharges on marine ecological values (generally);
  - (c) summarises the marine ecological values of Mangawhai Harbour;
  - (d) summarises the relevant aspects of PC78 with respect to the effects of urban stormwater and sediment runoff on marine ecological values associated with the increased intensification enabled by PC78 (excluding effects on shore and seabirds, which are addressed in the evidence of Dr Bramley);

- sets out an assessment of PC78 with respect to anticipated effects of stormwater and sediment runoff on marine ecological values (excluding effects on shore and seabirds); and
- (f) briefly addresses relevant matters raised in appeals and notices from s274 Parties.
- 7. This evidence is based on site visits conducted on 7 August and 16 October 2020, together with a desktop analysis and my experience and expertise on the matters outlined above. In particular, I have relied on:
  - (a) plans for bulk earthworks (Maday 2017, Zhang 2020) and existing Regional Council earthworks resource consents (AUT.042034.01.01 to AUT.042034.01.03, and AUT.039619.01.01 to AUT.039619.03.01);
  - (b) the stormwater management plan (Cruz 2019) and existing network discharge resource consent held by Kaipara District Council (AP.002111.01.03);
  - (c) the evidence and advice of other technical experts; and,
  - (d) publicly available reports and publications obtained through a desktop review of harbour characteristics and values, and the effects of sediment and contaminants.

### **EXECUTIVE SUMMARY**

8. I was engaged to provide expert advice on the marine ecological values of Mangawhai Harbour, and the potential effects of stormwater discharges (including during the bulk earthworks phase) on those values. Sediment and urban stormwater contaminants have the potential to cause a variety of direct and indirect adverse effects on marine biota. This can lead to the loss of sensitive species and increases in the abundance of tolerant species that benefit from changes in habitat quality and the loss of sensitive species. Sediment, copper, zinc and litter are considered to be the key contaminants of concern for Mangawhai Central. Other urban stormwater contaminants may also occur, but they tend to be of lesser importance

as sources capable of generating loads high enough to cause discernible, adverse ecological effects are unlikely to be present. Discharges can also affect the coastal environment through the physical effects of scouring and the associated mobilisation of sediment.

- 9. Mangawhai Harbour is a tidal lagoon and is therefore expected to be dominated by coastal water exchange. Tidal lagoons tend to have well mixed, homogeneous and sandy substrates in the mid to lower reaches, but sediment trapping, and infilling occurs in sheltered upper estuary areas. Available information indicates that multiple human activities have modified, and continue to affect, the natural ecological values of the Harbour, but overall marine ecological values are still considered to be high. They include large shellfish beds, healthy sediment dwelling macrofaunal communities, large areas of saltmarsh, and mangrove forests. The harbour is also likely to support a diverse fish assemblage. I therefore conclude that a high standard of environmental management is warranted for urban development in the surrounding catchment, and have queried and advised the project team on management approaches.
- 10. The effects of sediment runoff from sites undergoing bulk and construction earthworks on marine communities are hard to accurately predict. Risks are relatively low if appropriate sediment controls are implemented and major storm events do not occur during the earthworks phase. However, infrequent, but severe, storm events such as large cyclones can overwhelm sediment controls, leading to significant loads of sediment being discharged and deposited in the estuary. I note that such events also erode, disperse and deposit sediment from the broader catchment, so disentangling the ecological effects of the PC78 area from those of other inputs may be difficult. Furthermore, the risks posed by such events diminish as earthworks are progressively completed, and land is revegetated or built upon. I have been informed that around 50% of required earthworks have already been completed.

- 11. I therefore recommend the use of best practices for erosion and sediment control. The information and advice I have been provided indicates that best practice methods are being applied. The need for their application has been reinforced through the incorporation of 16.7.4.1(j)(ii) in PC78 (requiring the implementation of best practice erosion and sediment control), which is part of a comprehensive package of stormwater provisions in PC78 (outlined below) and which supplements earthworks controls under rules 13.10.1a and 14.10.1 of the Operative District Plan.
- 12. In my opinion the effects of PC78 on copper and zinc contamination are likely to be localised and minor (possibly negligible), and it is highly unlikely the standards set in Kaipara District Council's existing stormwater consent will be exceeded, because:
  - (a) contaminant yields are expected to be low;
  - (b) water sensitive approaches to development and stormwater management have been incorporated into PC78 and are being implemented in the development already underway;
  - (c) standards have already been set for currently consented<sup>1</sup> stormwater discharges, and the stricter standards of the Proposed Regional Plan for Northland would apply to future discharge consents (if required);<sup>2</sup>
  - (d) the physical characteristics of the mid to lower harbour (which are most likely to contain taxa that are sensitive to contaminant effects) are not conducive to contaminant accumulation;
  - (e) my experience of stormwater contaminant accumulation in other harbours and estuaries suggests that diffuse urban stormwater contaminants such as copper and zinc are unlikely to accumulate to levels of concern.

<sup>&</sup>lt;sup>1</sup> Consent held by Kaipara District Council.

<sup>&</sup>lt;sup>2</sup> I understand that the coastal water quality standards in the Proposed Northland Regional Plan (H.3.3) have recently been confirmed by decision of the Environment Court (*Minister of Conservation v Northland Regional Council* [2021] NZEnvC 170).

- 13. In response to my advice on the importance of litter, methods were presented by the engineering team for capturing and reducing it from high-generation areas, and PC78 includes 16.7.4.1(c)(v) which includes litter management among the assessment criteria for parking areas (which are regarded as high-generation areas).
- 14. In relation to the physical effects of stormwater outfalls and discharges, I recommended extra care be taken to diffuse flows in situations where discharges are to saltmarsh areas. In response an associated amendment to 16.10.8.2 (j) was incorporated into PC78.<sup>3</sup>

## POTENTIAL EFFECTS OF SEDIMENT AND URBAN STORMWATER RUNOFF ON MARINE ECOLOGICAL VALUES

- 15. The information below is primarily taken from a 2010 technical report I prepared for Auckland Council, which reviewed the ecological effects of urban stormwater (Kelly 2010). Although the review was conducted over 10 years ago, the information in it is still relevant today.
- 16. Typically, marine species (and life stages) are only able to live within a relatively narrow range of environmental conditions, and in many cases their requirements are quite specific. For estuarine species these requirements may include tolerance limits in relation to tidal height (or depth), proximity to channel margins, availability of hard substrates (or the ability to burrow to specific depths in soft substrates), salinity, pore water characteristics, sediment texture, turbidity and sediment deposition. The ability of a particular species to continue colonising and surviving in a particular area is likely to depend on the persistence of suitable habitat conditions. Those conditions can be altered by sediment and urban stormwater contaminants.
- 17. Stormwater commonly carries contaminants which alter the physical and chemical characteristics of marine habitats. Ecological

<sup>3 16.10.8.2 (</sup>j) reads: "Whether the proposal utilises low impact and/or water sensitive stormwater management devices and designs, outfalls that mitigate concentrated flows and detail of any obligations for lot owners to construct and maintain such devices".

communities respond by losing species that cannot tolerate the changes, and retaining or gaining species which are more tolerant of (or actually prefer) the new (albeit degraded) environmental conditions, and who may also benefit from the loss of sensitive species. Indirect ecological effects can also occur if stormwater induced changes to one species or community affect another species or community (e.g. mangrove expansion leads to the loss of mud-flat or sand-flat habitat).

- 18. The main physical and chemical parameters affected by stormwater in an urban setting are related to the discharge of litter, sediment and diffuse chemical contaminants. The ecological effects of these are considered below.
- 19. High suspended and deposited sediment loads pose a serious threat to coastal ecosystems. Sedimentation has contributed to the expansion of mangroves and in doing so, reduced the extent of other habitats (primarily sand and mud flats) and species. In coastal habitats, thick deposits of land-derived sediment rapidly kill most benthic macrofauna, while thin deposits lead to a reduction in species diversity and abundance. Recovery rates after depositional events tend to be slow and can take longer than a year. Suspended sediments reduce water clarity, light levels, food quality, and the feeding efficiency of animals. Consequently, New Zealand studies have shown that the physiological condition and survival rates of marine species frequently decline as suspended sediment concentrations increase.
- 20. Plastic materials are commonly discharged in stormwater and have rapidly accumulated in the marine environment over the past 50+ years. Plastic litter causes a range of adverse ecological effects. Plastics kill marine species through ingestion and entanglement, and act as a vector for the transport of invasive organisms. In addition, toxic additives which are used in the manufacture of some plastics, and organic contaminants which become concentrated on plastics, may also affect organisms that are intimately exposed to plastics.

- 21. Diffuse urban stormwater runoff also contains potentially toxic chemical contaminants. Heavy metals are a ubiquitous component of urban stormwater. The main metals of concern are copper and zinc, and sediment concentrations of these metals are commonly elevated in the upper reaches of sheltered urban estuaries (e.g. Williamson & Kelly 2003, Kelly 2017, Milne et al. 2009).
- 22. In addition to copper and zinc, a range of other metal, non-metallic, microbiological and organic (i.e. natural or synthetic carbon-based compounds) contaminants may also be present in stormwater runoff, and cause localised contamination. These include wastewater contaminants, fuels, oils, polycyclic aromatic hydrocarbons (PAHs), legacy pesticides (such as DDT, lindane, diedrin and chlordane), legacy synthetic compounds (such as PCBs) and newer emerging contaminants. However, they tend to be associated with specific sources, such as landfills, high traffic roads, specific industries and wastewater discharges. The absence or limited extent of these sources in Mangawhai Central, means that issues associated with these contaminants are highly unlikely to arise.
- 23. The risk of adverse ecological effects occurring is generally considered to be low when concentrations are below low-level sediment or water quality guideline values. However, not all guidelines are the same (see Table 1 for a comparison of heavy metal guidelines). They vary depending on their source and how they were derived. For sediment, the low level Threshold Effects Values (TELs) of MacDonald et al. (1996) are the most conservative (i.e. protective) set of commonly used guidelines in New Zealand, followed by the Effects Range Low (ERL) values of Long and Morgan (1990). These combined to produce Auckland Regional Council's were Environmental Response Criteria (ERCs), which were designed as a traffic light system that provided an early warning of potential ecological effects. The Australian and New Zealand Default Guideline Values (DGVs, ANZG 2018) are the least conservative of the low-level guidelines commonly referred to in New Zealand, but are also widely used.

- 24. The physical characteristics of the receiving environment have a significant influence on whether stormwater contaminants accumulate in estuary sediments or are flushed from the system. Relatively small receiving environments with poor flushing characteristics accumulate stormwater contaminants. In contrast, contaminants do not tend to build up in energetic, open receiving environments where they are widely dispersed and diluted.
- 25. New stormwater outfalls can also alter the characteristics of coastal areas through the construction of outfall structures, the scouring out of new or existing drainage channels, and through physical scour around outfall structures. Ecological effects can potentially arise from direct disturbance during outfall construction, and through the physical effects of scouring and the mobilisation of scoured sediment.

	Guidelines (mg/kg)					
	MacDonald et al. (1996)	Long & Morgan 1990	ANZG (2018)			
Metal/Metalloid	TEL	ERL	DGV			
Arsenic	7.2	8.2	20			
Cadmium	0.68	1.2	1.5			
Chromium	52	81	80			
Copper	18.7	34	65			
Lead	30.2	47	50			
Mercury	0.13	0.15	0.15			
Nickel	15.9	21	21			
Zinc	124	150	200			

### Table 1: Commonly used sediment quality guidelines. TEL, ERL and DGV guidelines are referred to.

# CHARACTERISTICS AND MARINE ECOLOGICAL VALUES OF MANGAWHAI INLET

26. The Mangawhai Harbour is classified as a tidal lagoon under the New Zealand Estuary Classification. Tidal lagoons are physically

characterised as being shallow estuaries with circular to elongated basins and simple shorelines with narrow entrances constricted by spits or sand barriers. Their large tidal prisms comprise a large proportion of total basin volume, and river inputs are small compared to tidal inflows. Consequently, they tend to be well flushed with a high proportion of water leaving the estuary on outgoing tides, and salinities are close to those at sea. Nevertheless, river inputs can dominate during significant flood events and potentially expel seawater from the system. Shallow depths, the resuspension of sediments by wind generated waves, and strong flushing results in these estuaries generally having well mixed, homogeneous and sandy substrates in the mid to lower reaches (see Hume et al. 2016). Conversely, shallow depths and broad intertidal areas promote sediment trapping and infilling in sheltered upper estuary areas.

- 27. Overlaid on those natural characteristics are the effects of people, who have modified and disturbed the harbour, including through:
  - (a) dredging of the outer channel to maintain navigable depths through the harbour entrance;
  - (b) the construction of causeways and bridges, which constrict the upper reaches of the harbour, trapping finer sediments and potentially mangrove propagules, and having localised effects on taxa abundance and diversity in benthic communities (Sjardin 2011);
  - (c) the construction of coastal structures, such as outfalls, seawalls, groins, boat ramps, jetties, and moorings;
  - (d) the discharge of stormwater from existing urban areas;
  - (e) mangrove clearance;
  - (f) rural landuses, that increase sedimentation and encroach into coastal wetlands;
  - (g) fish and shellfish harvesting;

- (h) activities that produce underwater noise and disturb wildlife; and,
- (i) other activities that disturb coastal cliffs and exacerbate coastal erosion (such as the third-party construction of an unconsented coastal walkway, adjoining and encroaching into the PC78 area).
- 28. Having said that, the harbour does retain good sediment quality and high marine ecological, habitat and kai moana values. Its high values are reflected in three areas within the mid to outer harbour basin (some distance from the PC78 site) being identified as significant ecological areas in the Proposed Regional Plan for Northland. Data obtained by Northland Regional Council indicates that those areas contain healthy sandflats with extensive cockle beds, pipi, wedge shells and a variety of other epifaunal invertebrates are also present (Griffiths et al. 2020).
- 29. Cockle and pipi populations in the lower harbour are regularly monitored by the Ministry for Primary Industries, who survey four strata covering a total of 7.5 ha. Total population size estimates for those strata ranged from 23.5 to 98.7 million cockles and 0.78 to 6 million pipi between the 1999-00 and 2016-17 surveys (Berkenbusch & Neubauer 2017). General declines in large (harvestable) cockles and pipi had occurred in Mangawhai and most of the other 11 upper North Island estuaries, harbours and beaches surveyed by Berkenbusch and Neubauer (2017). Taken together, this illustrates that shellfish are abundant in the harbour, but it also suggests that like elsewhere, their populations are impacted by harvesting.
- 30. Benthic community composition and coastal habitats transition up the harbour, with extensive mangrove and adjoining coastal saltmarsh habitats replacing the open sandflats of the mid to lower harbour areas. These are the habitats that stormwater runoff from Mangawhai Central will discharge to. The area around Molesworth Road Bridge, at the north-eastern corner of Mangawhai Central has been a focal area for a number of studies. It contains saltmarsh, mangrove (forest

and breathing root (pneumatophore) zones), sandflat, and subtidal channel habitats. Available information (Bastakoti 2019) indicates that just below Molesworth Bridge, concentrations of the key heavy metals (copper and zinc) are well below TEL guideline values in seabed sediments within mangrove habitat (which in general tend to have higher concentrations than those on surrounding sandflats), with zinc concentrations close to likely-background levels (Diffuse Sources Ltd. 2004).

- 31. Macrofaunal invertebrates found in habitats around Molesworth Road Bridge include polychaete and oligochaete worms, a variety of marine snails and bivalves (including cockles, pipi and wedge shells), crabs, shrimp, barnacles, and other small crustacea (amphipods and isopods) (Alfaro 2010). Notably, the species reported include those known to have a strong preference of sandy substrates (pipi, the whelk *Cominella glandiformis*, the mudflat topshell *Diloma subrostrata* (Gibbs & Hewitt 2004)) and species that are sensitive to stormwater contaminants (cockles, pipi and wedge shells (Hewitt et al. 2009)). Their presence is consistent with the existing area currently having good sediment quality (i.e., largely uncontaminated sand or muddy sand).
- 32. While I do not address effects on birds,<sup>4</sup> I note that fish and invertebrate communities sustain coastal birds that utilise the harbour. That includes one of New Zealand's most endangered species, the New Zealand Fairy Tern. Little published information appears to be available on the Mangawhai fish community. However, it is reasonable to assume that the fish assemblage would be similar to that in and around Whangateau Harbour, where at least 43 fish species have been reported (reviewed in Kelly (2009)). The diversity of fish in Whangateau is reflected in the wide diversity of fish behaviours, and fish habitat and resource use. Those not only vary among species, but also among age classes within species. Similar levels of fish diversity, behaviour and resource use are expected in Mangawhai.

<sup>&</sup>lt;sup>4</sup> Refer to the evidence of Dr Bramley.

- 33. At Mangawhai, extensive mangrove forests occupy a large proportion of the upper estuary, with sizable stands also found in shallow sections of the mid-harbour. The expansion of mangroves is an issue of community concern and since 2015, consented clearances have occurred in several areas.
- 34. Coastal wetlands in the Tara Creek, above the Molesworth Road Bridge include the King Road Saltmarsh (Figure 1), which was ranked 18<sup>th</sup> out Northland's top 49 Estuary wetlands based on criteria that among other things took into account its actual and relative size, hydrological integrity, representativeness and threatened species (Martin 2011). The report noted that:

The site contains a range of different wetland types, including mangrove forest, saltmarsh ribbonwood shrubland, and oioi saltmeadow. It also forms an ecological sequence with terrestrial indigenous shrubland. Weeds are largely absent from the site. Hydrological integrity may be threatened by future development along the true left of the river, close to the river mouth.

- 35. The extent of that saltmarsh is not clearly defined, but it is reasonable to assume that it encompasses the area of saltmarsh in the inlet north of Mangawhai Central, as neighbouring areas of saltmarsh are likely to be ecologically connected. Aerial photographs clearly show that King Road and other areas of saltmarsh in Mangawhai Harbour have been adversely impacted by encroachment from roading and farming, and what appears to be the straightening of tidal channels in some areas.
- 36. In summary, the overall marine ecological values of Mangawhai Harbour are considered high, even though multiple human activities have modified, and continue to affect, the natural ecological values of the Harbour. In my view, therefore a high standard of environmental management is warranted for urban development in the surrounding catchment.



# Figure 1: Saltmarsh habitat in Tara Creek, with the assumed extent of King Road Saltmarsh shown in blue.

### **PLAN CHANGE 78**

37. The full range of PC78 provisions are addressed in detail in the application documents and the evidence (see in particular the evidence of Mr Tollemache), and I do not repeat that material in my evidence. The key aspects of PC78 relevant to my area of expertise are those elements that potentially alter the generation of sediment and stormwater contaminants and affect loads discharged to the coastal environment. The potential for discharges and coastal structures to physically disturb the coastal margin and nearshore environment are also relevant matters. These matters are generally covered through:

- (a) the proposed PC78 provisions for stormwater management (which are also addressed in the evidence of Mr Van de Munckhof), including the provisions below:
  - Policies 16.3.1.1 10) and 11) addressing stormwater management, treatment, water sensitive design and consistency with the Regional Stormwater Discharge Consent.
  - (ii) Policy 16.3.8.1 12) to address the management of stormwater from larger commercial car parks.
  - (iii) Policy 16.3.11.1 1A) to address the management of stormwater associated with subdivision.
  - (iv) Rules 16.10.10.4.3 for stormwater disposal.
  - (v) Assessment criteria 16.7.4.1 c) v. for litter management.
  - (vi) Rule 16.9.3.2 c) and assessment criteria 16.9.3.2.1 c) for an activity providing more than 30 car parks to manage stormwater treatment.
  - (vii) Discretions 16.7.4.1 e) iv., 16.7.4.1 g). and 16.10.8.1 e) for low impact design associated with stormwater and assessment criteria 16.10.8.2 j) and jj) for stormwater treatment.
  - (viii) Discretion 16.10.8.1 eee) to require stabilised roofing material.
  - (ix) I also understand that reference to Auckland Council Guideline documents GD01, GD04, GD05 and GD07<sup>5</sup> is proposed to be included within the PC78 provisions.
- (b) plans for bulk earthworks (Maday 2017, Zhang 2020) and existing Regional Council resource consents

<sup>&</sup>lt;sup>5</sup>Guideline Document 2017/01 Stormwater Management Devices in the Auckland Region. December 2017 (Amendment 2); Guideline Document 2015/04 Water Sensitive Design for Stormwater. March 2015; Guideline Document 2021/07 Stormwater Soakage and Groundwater Recharge in the Auckland Region. Version 1, 2021.

(AUT.042034.01.01 to AUT.042034.01.03, and AUT.039619.01.01 to AUT.039619.03.01)<sup>6</sup>;

- (c) the stormwater management plan (Cruz 2019) and existing network discharge resource consent issued by the Northland Regional Council to the Kaipara District Council (AP.002111.01.03).
- 38. I have reviewed the listed documents and the evidence of the civil engineer, Mr. Dufty. I have also queried and advised the engineers and planner, Mr Tollemache, on matters relevant to my area of expertise. Based on that, I consider the following information to be particularly relevant to the management of discharge effects on marine ecological values.

### **Discharges related to earthworks**

- 39. The effects of sediment runoff from sites undergoing bulk and construction earthworks on marine communities are hard to accurately predict. Risks are relatively low if appropriate sediment controls are implemented and major storm events do not occur during the earthworks phase. Infrequent, but severe, storm events such as large cyclones can overwhelm sediment controls, leading to significant loads of sediment being discharged and deposited in the estuary. The risks posed by such events diminish as earthworks are progressively completed, and land is revegetated or built upon.
- 40. I have conveyed to the engineering team the potential threat that sediment poses to the coastal ecosystem, and recommended the use of best practices for erosion and sediment control. The information and advice I have been provided indicates that is already the case, and that best practices will continue to be applied to future development. Mr Dufty has advised me that a comprehensive set of sediment controls has been implemented for past, and ongoing, bulk earthworks, including:

<sup>&</sup>lt;sup>6</sup> Consents related to cut and fill earthworks, and the associated diversion and discharge of stormwater from earthworks sites (**appended**).

- (a) stabilised construction entrances;
- (b) clean water and dirty diversion drains;
- (c) decant earth bunds;
- (d) oversized sediment retention ponds;
- (e) super silt fences and standard silt fences;
- (f) progressive stabilisation as earthworks are completed; and
- (g) sediment flocculation using state-of-the-art electronic dosing control.
- 41. Non-structural measures such as monitoring and reporting, risk identification and management, weather response processes, staging, regular device maintenance, and directing work activity to reduce effect of sediment yield into the receiving environment, have also been applied. I understand that the above suite of measures is intended to also be implemented for future earthworks; and that both the operative Chapter 16 of the District Plan<sup>7</sup> and PC78 would provide a framework for facilitating this by way of resource consent requirements (along with the regional planning framework).
- 42. PC78 incorporates a range of best practice methods and other requirements relating to stormwater (as outlined above), which supplements existing controls under rules 13.10.1a and 14.10.1 of the Operative Plan. In particular, 16.7.4.1(j)(ii) in PC78 requires the implementation of best practice erosion and sediment control.
- 43. In addition, existing regional earthworks discharge consent<sup>8</sup> conditions currently require, among other things, that none of the following effects on water quality occur, as measured at the downstream property boundary:

<sup>&</sup>lt;sup>7</sup> Operative Rule 16.8.2.11 (earthworks)

<sup>&</sup>lt;sup>8</sup> Condition 14 AUT.042034.01.01 to AUT.042034.01.03, and Condition 11 AUT.039619.01.01 to AUT.039619.03.01 (appended).

- (a) the production of any conspicuous oil or grease films, scums or foams, floatable or suspended materials, or emissions of objectionable odour;
- (b) a suspended solids concentration greater than 100 grams per cubic metre.
- 44. Overall, I am satisfied that best practice in sediment control is being applied to minimise environmental risk. Having said that, I still recognise that major storm events can potentially overwhelm the best of systems and adversely impact benthic communities within the estuary.

### Discharges from the stormwater network

- 45. I consider the main diffuse urban stormwater contaminants of concern to be copper, zinc and litter (particularly plastics). Development controls<sup>9</sup> in the Operative Chapter 16 of the District Plan already incorporate existing provisions for the safe storage and use of hazardous substances. Therefore, contaminant effects from point sources of hazardous substances should not occur if those controls are effectively implemented.
- 46. Relatively low traffic volumes, restrictions on roof materials<sup>10</sup>, and onsite water capture means that yields of diffuse stormwater contaminants should be low in most areas (local yields from the main arterial road and uncovered carparks in service and business zones are expected to be higher). Approximately 30 hectares will be protected within the Natural Environment Sub Zone 8, while stormwater runoff from impervious surfaces will be directed through a train of treatment devices prior to discharging to the coast. Those practices, are consistent with proposed PC78 provisions for managing stormwater effects, which include (but are not limited to):

<sup>&</sup>lt;sup>9</sup> Operative Rule 16.8.4.

<sup>&</sup>lt;sup>10</sup> PC78 proposed discretion 16.10.8.1 eee).

- (a) Objective 16.3.1, relating to conserving, protecting and enhancing the coastal marine environment (among other things).
- (b) Policy 16.3.1.1 (10) relating to ensuring that stormwater is managed and treated to maintain and enhance the health and ecological values of coastal marine environment<sup>2</sup> (among other things).
- (c) the utilisation of low impact stormwater design solutions (16.7.4.1 (e)(iv), 16.10.8.1 (e), 16.10.8.2 (j) and (jj)) as a matter of discretion and an associated assessment criteria;
- (d) the extent to which the activities give rise to adverse effects on the natural environment through stormwater and sediment runoff (16.7.4.1 (g)) as an assessment criterion;
- (e) the extent to which stormwater quality treatment to protect the environment from contaminants for activities with more than 30 carparks (16.9.3.2.1 (c)) as a matter of discretion.
- 47. Existing stormwater network discharge consent conditions (AUT 002111.03.02)<sup>11</sup> also require, among other things:
  - (a) Sediment heavy metal concentrations (cadmium, chromium, copper, lead, nickel and zinc) at or beyond a 30 m radius of outfalls to remain below ANZG (2018) default guideline values (DVGs), which are equivalent to the earlier ANZECC (2000) low level, interim sediment quality guidelines (ISQG-L).
  - (b) Discharges not to result in:
    - the production of any conspicuous oil or grease films, scums or foams, floatable or suspended materials, or emissions of objectionable odour;
    - the destruction of natural aquatic life through the concentration of toxic substances; or,

<sup>&</sup>lt;sup>11</sup> Appended to my evidence.

- (iii) shellfish to be tainted, making them unpalatable, or contaminated to the point they are unsafe for human consumption.
- 48. In relation to ecological effects of the key metals in urban stormwater discharges associated with PC78, I expect them to be localised and minor (possibly negligible). I am more certain about those effects (compared with sediment effects from bulk and secondary construction earthworks) because:
  - (a) Urban stormwater contaminant loads are constrained by the presence of contaminant sources in the catchment, and their amounts and mobility. Unlike sediment from bulk earthworks sites, where the supply sediment is effectively unlimited, the key urban stormwater contaminants, copper, zinc, and litter tend to accumulate between storm events, with accumulated contaminants being washed off exposed surfaces during events (sediment yields are expected to be low once development is complete).
  - (b) Overall contaminant yields are expected to be low in stormwater due to relatively low traffic volumes (noting that higher yields may be locally generated in the areas highlighted in Paragraph 46), source controls on cladding material, and water storage and reuse.
  - (c) Stormwater treatment trains (i.e. treatment devices connected in a series) are being used to catch contaminants that cannot be contained at source.
  - (d) Stormwater treatment devices will recharge groundwater via the use of retention/infiltration which reduces the potential for contaminants to reach the estuary.
  - (e) Environmental standards for existing stormwater discharges have been set through existing consent conditions, while stricter water and sediment quality standards have been included in the Proposed Regional Plan for Northland.

- (f) The physical characteristics of the mid to lower harbour (which are most likely to contain taxa that are sensitive to contaminant effects) are not conducive to contaminant accumulation:
  - coarse, sandy sediments in the mid-lower harbour, are less prone to heavy metal accumulation than muddy sediments,
  - shallow depths, together with wind generated waves and strong tidal flushing, reduce the potential for accumulation, by promoting sediment (and contaminant) resuspension and redispersal.
- 49. Importantly, experience of stormwater contaminant accumulation in other harbours and estuaries also indicates that diffuse urban stormwater contaminants are unlikely to accumulate to toxic levels in this situation. Long term monitoring data from the Auckland Region is particularly informative on this matter. Auckland Council have been regularly monitoring urban sediment contamination since 1998 and have built up an extensive picture of copper and zinc concentrations across a spectrum of urbanisation. I have compared Auckland Council results with the commonly used low-level international, and Australian and New Zealand sediment quality guidelines provided in Table 1.
- 50. Spatial plots of the Auckland Council data (Figure 1) show that in most intensively developed urban areas, copper and zinc concentrations are below all three guideline values. DVG and ERL values are only exceeded in the most contaminated parts of Auckland's urban harbour's and estuaries. Zinc exceedances tend to be associated with older urban areas, with the surrounding catchment containing intensive industrial land uses, closed landfills along the shore and/or older buildings clad in unpainted galvanised steel. Copper concentrations seldom exceed ERL levels, but frequently exceed TEL levels in similar locations to those described above for zinc. Copper concentrations also exceed TEL levels in the Upper Waitemata Harbour, which until recently had a predominantly rural

catchment. The reasons for elevated copper concentrations in that area are unclear.

- 51. As stated earlier, the limits set in the KDC's stormwater discharge consent are based on the least conservative of these (DGVs), whereas updated sediment quality standards in the Proposed Regional Plan for Northland (see Policy H.3.4) are based on the most conservative of the commonly applied guidelines (TELs). New subdivision applications that do not come within the scope of existing network discharge consents<sup>12</sup> would need to address those requirements.
- 52. Given the considerations outlined above, ecological effects of PC78 are likely to be localised and minor (possibly negligible), and are highly unlikely to exceed the standards set in the existing stormwater consent. The standards in the Proposed Regional Plan for Northland provide additional protections for discharges from new subdivisions.<sup>13</sup>
- 53. Responses to my identification of litter as a key contaminant are addressed in the evidence of Mr. Dufty, who has identified methods for capturing and reducing litter from high-generation areas. 16.7.4.1(c) of PC78, which includes litter management among the assessment criteria for high, litter generating, parking areas has also been proposed.
- 54. In relation to the physical effects of outfall structures and discharges, to minimise the potential for adverse physical effects on saltmarsh areas, I have recommended that structures are placed and/or designed to avoid concentrated flows (i.e. design for diffuse flows). I have been advised that engineering options are available to do that (described in the evidence of Mr. Dufty), and PC78 16.10.8.2 (j) addresses the issue.<sup>14</sup>

<sup>&</sup>lt;sup>12</sup> And are not otherwise permitted.

<sup>&</sup>lt;sup>13</sup> Where stormwater discharges require consent.

<sup>&</sup>lt;sup>14</sup>16.10.8.2 (j) reads: "Whether the proposal utilises low impact and/or water sensitive stormwater management devices and designs, outfalls that mitigate concentrated flows and detail of any obligations for lot owners to construct and maintain such devices".

55. I also note that at least some of the physical effects of stormwater discharges are capable of being managed by plans to improve and/or remediate coastal areas in the vicinity of the unconsented coastal walkway along Tara Creek, and to stabilise slumping coastal cliff areas affected by the presently unconsented structures, and runoff.



*Figure 2: Zinc and copper concentrations in marine sediments from Waitemata and Tamaki Inlet, Auckland, relative to commonly used sediment quality guidelines.* 

### **RESPONSE TO ISSUES RAISED BY APPELLANTS/S274 PARTIES**

- 56. Mangawhai Matters, NZ Fairy Tern Charitable Trust and Mr Peter Rothwell have raised general concerns about stormwater and sediment discharges from Mangawhai Central to the estuary and uncertainty about the likely effects of sediment runoff on marine communities.
- 57. As outlined above, Dr Bramley addresses effects on birds in his evidence. However, based on my understanding the concerns expressed in the NZ Fairy Tern Charitable Trust s274 notice, my evidence will be relevant to their concerns.
- 58. As outlined above, I acknowledge that the ecological values of Mangawhai Harbour are high, and as such, high levels of stormwater and sediment management are warranted to ensure those values are sustained. I have therefore worked with the engineering and planning team to highlight what, in my opinion, are the key issues. The team has been responsive to the matters raised and proactively acted to identify planning and engineering solutions, including by proposing amendments to PC78 (which are included in the version of PC78 attached to Mr Tollemache's evidence).
- 59. I understand that the proposed measures for erosion and sediment control are consistent with best practice (which is in line with my recommendation, and which is required by the provisions of PC78) and are in accordance with existing Regional Consent requirements. In the case of urban stormwater contaminants, for the reasons outlined earlier, it is my opinion that the ecological effects of diffuse stormwater contaminants arising from PC78 are likely to be localised and minor (possibly negligible) and are highly unlikely to exceed the standards set in the existing stormwater consent. The Proposed

Regional Plan for Northland standards provide additional protections for discharges from new subdivisions.<sup>15</sup>

Dr. Shane Kelly Coast and Catchment Ltd

17 December 2021

<sup>&</sup>lt;sup>15</sup> Where they require consent.

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## Appendix 1: Existing Bulk Earthworks Consents

AUT.042034.01.01 to AUT.042034.01.03

**Resource Consent** 

FILE: 42034 (01 to 03) New

Document Date: 18.08.2020

P	ursuant to th (hereinafte	e Resource Management Act 1991, the Northland Regional Council r called "the council") does hereby grant a Resource Consent to:
MANGAW	HAI CENTRAI	L LTD, PRIVATE BAG 93534, TAKAPUNA, AUCKLAND 0740
To underta about loca	ake the follov tion co-ordin	ving activities on Lot 4 DP 154785 (83 Molesworth Drive, Mangawhai), at or ates 1740960E 6003091N:
Note: All Tri	location co- ansverse Mer	-ordinates in this document refer to Geodetic Datum 2000, New Zealand cator Projection.
AUT.0420	34.01.01	Cut and fill earthworks for subdivision development.
AUT.0420	34.01.02	Discharge of stormwater associated with land disturbance.
AUT.0420	34.01.03	Divert stormwater associated with land disturbance.
Subject to	the following	; conditions:
1 Th th se pr he	e Consent Ho at works are ason. The Co incipal earthn Id on site prio	Ider shall notify the council's assigned monitoring officer in writing of the date intended to commence, at least one week beforehand, in each construction onsent Holder shall arrange for a site meeting between the Consent Holder's noving contractor and the council's assigned monitoring officer, which shall be or to any earthworks commencing in each construction season.
Ac	lvice Note:	Notification to the council may be made by email to <u>info@nrc.govt.nz</u> .
2 As to hc M in	part of the v the council's w dust will be anagement Pl clude (but is r	vritten notice required by Condition 1, the Consent Holder shall also forward assigned monitoring officer a Dust Management Plan that provides details on e managed to avoid any adverse effects on neighbouring properties. The Dust lan shall be prepared by a suitably qualified and experienced person and shall not limited to) the following details:
(a)	The staging screening	ng of works, duration and area of exposed works, speed limits on access roads, g, use of water carts and sprinkler systems, or other dust suppression methods;
(b)	Procedur	es for revegetating bare surfaces;
(c)	The volur	ne of water required for dust suppression;
(d)	Sources o	of water for the control of dust.
Ad	vice Note:	If water is to be taken from any other source than the farm dam on-site, then additional resource consent may be required for the water take.



RC OCTOBER 2019 (REVISION 16)

- 3 Prior to the exercise of these consents, the Consent Holder shall provide details of all offsite disposal areas to the council's assigned monitoring officer and provide evidence that resource consents are held for these sites, or that the disposal sites that have been selected meet the permitted activity standards of the relevant council plan(s).
- 4 The Consent Holder shall ensure that the works and stormwater system are constructed generally in accordance with the **attached** McKenzie & Co Consultants Ltd drawings for Mangawhai Central Limited entitled:
  - (a) "BULK EARTHWORKS STAGE 2 TOPOGRAPHIC PLAN", Drawing No. 1450-BEW2-110, Rev. A, dated 09/03/20;
  - (b) BULK EARTHWORKS STAGE 2 OVERALL TOPOGRAPHIC PLAN", Drawing No. 1450-BEW2-020, Rev. A, dated 22/04/20;
  - BULK EARTHWORKS STAGE 2 FINISH CONTOURS PLAN", Drawing No. 1450-BEW2-200, Rev. A, dated 15/05/20;
  - BULK EARTHWORKS STAGE 2 OVERALL CUT AND FILL PLAN", Drawing No. 1450-BEW2-210, Rev. A, dated 22/04/20;
  - BULK EARTHWORKS STAGE 2 SEDIMENT CONTROL PLAN", Drawing No. 1450-BEW2-230, Rev. A, dated 15/05/20;
  - BULK EARTHWORKS STAGE 2 SEDIMENT CONTROL PLAN WITHOUT AERIAL", Drawing No. 1450-BEW2-231, Rev. A, dated 15/05/20;
  - (g) BULK EARTHWORKS STAGE EROSION AND SEDIMENT CONTROL DETAILS SHEET 1", Drawing No. 1450-BEW2-290, Rev. A, dated 12/12/19;
  - (h) BULK EARTHWORKS STAGE EROSION AND SEDIMENT CONTROL DETAILS SHEET 2", Drawing No. 1450-BEW2-291, Rev. A, dated 12/12/19;
  - BULK EARTHWORKS STAGE EROSION AND SEDIMENT CONTROL DETAILS SHEET 3", Drawing No. 1450-BEW2-292, Rev. A, dated 12/12/19.
- 5 Sediment control measures shall be constructed and maintained in accordance with the principles and practices contained within the Auckland Council document entitled "Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region 2016 (GD2016/005). Where there are inconsistencies between any part of GD2016/005 and the conditions of these consents, then the conditions of these consents shall prevail.
- 6 Erosion and sediment controls shall be installed prior to the commencement of earthworks (other than those required for the erosion and sediment controls) within each area of works.
- 7 The installation of all erosion and sediment controls shall be supervised by an appropriately qualified and experienced person. The Consent Holder shall provide to the council's assigned monitoring officer certification from the appropriately qualified and experienced person who supervised the installation of the erosion and sediment controls that they have been installed in accordance with the requirements of Conditions 4 and 5 of this consent.
- 8 No earthworks shall be carried out between 1 May and 30 September in any year unless the prior written agreement of the council's Compliance Manager has been obtained.
- 9 Any request to undertake works between 1 May and 30 September in any year must be in writing and shall be made at least two weeks prior to the proposed date that the works are required to be undertaken.

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- 10 Drains and cut-offs constructed to divert stormwater shall be capable of conveying stormwater during not less than the estimated 1 in 20 year rainfall event. All channels on grades greater than 2% shall be protected to avoid erosion occurring.
- 11 All offsite stormwater shall be directed away from earthworks areas.
- 12 No drainage pathways shall be constructed, or permitted to flow, over fill areas in a manner that creates erosion of the fill material.
- 13 No slash, soil, debris and detritus shall be placed in a position where it may be washed into a water body.
- 14 The exercise of these consents shall not cause any of the following effects on the water quality as measured at the downstream property boundary:
  - (a) The production of any conspicuous oil or grease films, scums or foams, floatable or suspended materials, or emissions of objectionable odour;
  - (b) A suspended solids concentration greater than 100 grams per cubic metre.
- 15 All earthworks operations shall be carried out in a manner that minimises the potential for slope instability and soil erosion. Effective mitigation measures shall be installed as required to mitigate and/or remedy any slope failures.
- 16 All bare areas of land and fill shall be covered with aggregate, or topsoiled and established with a suitable grass/legume mixture to achieve an 80% groundcover within one month of the completion of earthworks in each earthworks stage. Temporary mulching or other suitable groundcover material shall be applied to achieve total groundcover of any areas unable to achieve the above requirement.
- 17 The exercise of these consents shall not give rise to any discharge of contaminants, including dust, which in the opinion of a monitoring officer of the council is noxious, dangerous, offensive or objectionable at or beyond the property boundary.
- 18 Refuelling and servicing of machinery shall not be carried out in such a way that soil or water at the site is contaminated. Where an accidental spillage to land occurs, all contaminated soil shall be collected and removed to a suitable disposal site.
- 19 Consent Holder shall, on becoming aware of any discharge associated with the Consent Holder's operations that is not authorised by these consents:
  - Immediately take such action, or execute such work as may be necessary, to stop and/or contain the discharge; and
  - (b) Immediately notify the council by telephone of the discharge; and
  - (c) Take all reasonable steps to remedy or mitigate any adverse effects on the environment resulting from the discharge; and
  - (d) Report to the council's Compliance Manager in writing within one week on the cause of the discharge and the steps taken, or being taken, to effectively control or prevent the discharge.

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For telephone notification during the council's opening hours, the council's assigned monitoring officer for these consents shall be contacted. If that person cannot be spoken to directly, or it is outside of the council's opening hours, then the Environmental Hotline shall be contacted.

## Advice Note: The Environmental Hotline is a 24 hour, seven day a week, service that is free to call on 0800 504 639.

- 20 In the event of new archaeological sites or kõiwi being uncovered, activities in the vicinity of the discovery shall cease and the Consent Holder shall contact Te Uri o Hau and Heritage New Zealand Pouhere Taonga. Work shall not recommence in the area of the discovery until the relevant Heritage New Zealand Pouhere Taonga approval has been obtained.
  - Advice Note: The Heritage New Zealand Pouhere Taonga Act 2014 makes it unlawful for any person to destroy, damage or modify the whole or any part of an archaeological site without the prior authority of Heritage New Zealand Pouhere Taonga.
- 21 The council may, in accordance with Section 128 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions annually during the month of May for any one or more of the following purposes:
  - (a) To deal with any adverse effects on the environment that may arise from the exercise of these consents and which it is appropriate to deal with at a later stage; or
  - (b) To require the adoption of the best practicable option to remove or reduce any adverse effect on the environment.

The Consent Holder shall meet all reasonable costs of any such review.

22 These consents shall not lapse until their expiry.

### **EXPIRY DATE:**

#### 31 AUGUST 2025

These consents are granted this Eighteenth day of August 2020 under delegated authority from the council by:

Paul Maxwell Coastal & Works Consents Manager

**Note:** The plans attached to this consent are reduced copies and therefore may not be to scale and may be difficult to read. In the event that compliance and/or enforcement action is to be based on compliance with the attached plans, it is important that the original plans, are sighted and used. Originals of the plans referred to are available for viewing at the council's Whangārei office.

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ELEC RCAUGUST 2016 (REVISION5)

**Putting Northland first** 



- As part of the written notice required by Condition 2, the Consent Holder shall also forward to the council's assigned monitoring officer a **Dust Management Plan** that provides detail on how dust will be managed to avoid any adverse effects on neighbouring properties. The Dust Management Plan shall be prepared by a suitably qualified and experienced person and shall include (but is not limited to) the following details:
  - (a) The staging of works, duration and area of exposed works, speed limits on access roads, screening, use of water carts and sprinkler systems, or other dust suppression methods;
  - (b) Procedures for revegetating bare surfaces;
  - (c) The volume of water required for dust suppression;
  - (d) Sources of water for the control of dust.

Advice Note: If water is to be taken from any other source than the farm dam onsite, then additional resource consent may be required for the water take.

- 4 The earthworks shall be undertaken in stages as shown on the plans referenced by Condition 1(d). The total area of bare fill exposed at any time in a single stage of earthworks shall be no greater than 15 hectares. Stabilisation of bare areas of fill shall be undertaken in accordance with Condition 10 prior to undertaking earthworks in any subsequent stage.
- 5 Sediment control measures shall be constructed and maintained in accordance with the principles and practices contained within the Auckland Council document entitled "GD05: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region". Where there are inconsistencies between any part of GD05 and the conditions of these consents, then the conditions of these consents shall prevail.
- 6 Drains and cut-offs shall be constructed to divert stormwater and minimise erosion of land and fill slopes and shall be capable of conveying stormwater during not less than the estimated 1 in 20 year rainfall event. All channels on grades greater than 5% shall be protected to avoid creating erosion features. All offsite stormwater shall be directed away from earthworks areas and no drainage pathways shall be constructed or permitted to flow over fill areas in a manner that creates erosion of the fill material.
- 7 Erosion and sediment controls shall be installed prior to the commencement of each earthworks stage (other than those required for the erosion and sediment controls) within the works area. The installation of all erosion and sediment controls shall be supervised by an appropriately qualified and experienced person(s).
- 8 No earthworks shall be carried out between 1 May and 30 September in any year unless the prior written agreement of the council's Compliance Manager has been obtained.
- 9 No slash, soil, debris and detritus associated with the exercise of these consents shall be placed in a position where it may be washed into any water body.

ELEC RC AUGUST 2016 (REVISION 5)

3

- 10 All bare areas of land and fill shall be covered with aggregate, or topsoiled and established with a suitable grass/legume mixture to achieve an 80% groundcover within one month following the completion of earthworks in each earthworks stage. Temporary mulching or other suitable groundcover material shall be applied to achieve total groundcover of any areas unable to achieve the above requirements.
- 11 The exercise of these consents shall not cause in any of the following effects on water quality, as measured at the downstream property boundary:
  - (a) The production of any conspicuous oil or grease films, scums or foams, floatable or suspended materials, or emissions of objectionable odour;
  - (b) Suspended solids concentration greater than 100 grams per cubic metre;
  - (c) pH outside the range 6.5 to 9.0 units.
- 12 The Consent Holder shall, for the purposes of adequately monitoring these consents as required under Section 35 of the Act, on becoming aware of any contaminant associated with the Consent Holder's operations escaping otherwise than in conformity with these consents:
  - (a) Immediately take such action, or execute such work as may be necessary, to stop and/or contain such escape; and
  - (b) Immediately notify the council by telephone of an escape of contaminant; and
  - (c) Take all reasonable steps to remedy or mitigate any adverse effects on the environment resulting from the escape; and
  - (d) Report to the council's Monitoring Manager in writing within one week on the cause of the escape of the contaminant and the steps taken or being taken to effectively control or prevent such escape.

For telephone notification during the council's opening hours, the council's assigned monitoring officer for these consents shall be contacted. If that person cannot be spoken to directly, or it is outside of the council's opening hours, then the Environmental Emergency Hotline shall be contacted.

Advice Note: The Environmental Emergency Hotline is a 24 hour, seven day a week, service that is free to call on 0800 504 639.

- 13 In the event of archaeological sites or kōiwi being uncovered, activities in the vicinity of the discovery shall cease and the Consent Holder shall contact Heritage New Zealand Pouhere Taonga. Work shall not recommence in the area of the discovery until the relevant Heritage New Zealand Pouhere Taonga approval has been obtained.
  - Advice Note: The Heritage New Zealand Pouhere Taonga Act 2014 makes it unlawful for any person to destroy, damage or modify the whole or any part of an archaeological site without the prior authority of Heritage New Zealand Pouhere Taonga.
- 14 The council may, in accordance with Section 128 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions annually during the month of August for any one or more of the following purposes:

ELEC RC AUGUST 2016 (REVISION 5)

- (a) To deal with any adverse effects on the environment that may arise from the exercise of these consents and which it is appropriate to deal with at a later stage; or
- (b) To require the adoption of the best practicable option to remove or reduce any adverse effect on the environment.

The Consent Holder shall meet all reasonable costs of any such review.

### EXPIRY DATE:

### 30 NOVEMBER 2022

This consent is granted this Twenty-seventh day of November 2017 under delegated authority from the Council by:

Savill

Stuart Savill Consents Manager

ELEC RC AUGUST 2016 (REVISION 5)