BEFORE A HEARING PANEL
CONSTITUTED BY HORIZONS REGIONAL COUNCIL

IN THE MATTER OF	an application dated 21 December 2020 for regional consents by Grenadier Limited to develop the Douglas Link Golf Course at 765 Muhunoa West Road, Ōhau
IN THE MATTER OF	Part 6 of the Resource Management Act 1991

STATEMENT OF EVIDENCE OF THOMAS PETER BLAND

Applicants' Consultant:

Land Matters Limited
20 Addington Road
Otaki

Attn: Tom Bland
tom@landmatters.nz
027 877 894

Counsel acting:

John Maassen
BARRISTER

john@johnmaassen.com
johnmaassen.com
04 914 1050
04 473 3179

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Section A – Introduction

Name, qualifications and experience

[1] My full name is Thomas Peter Bland. I am employed as a Senior Planner at Land Matters Limited in Ōtaki. I have been with Land Matters since 2016.

[2] I hold a Master of Environmental Planning (with Distinction) from the University of Waikato and a B.Sc. (Hons) in Environmental Management from Lancaster University (UK).

[3] I have been a Full Member of the New Zealand Planning Institute since 2008. I have 21 years experience as a planning and resource management professional in New Zealand and the United Kingdom.

[4] I have worked in central government, local government and private consultancy. I have prepared resource consent applications for various projects for greenfield residential developments, commercial activities and large-scale energy infrastructure projects. I have been involved in private plan changes and plan development in several regions of New Zealand and have appeared before the Environment Court for resource consent and district plan matters.

Expert Code

[5] While this is not an Environment Court hearing, I have met the standards in that Court for giving expert evidence.

[6] I have read the Code of Conduct for expert witnesses issued as part of the Environment Court Practice Note 2014 (Part 7). I agree to comply with the Code of Conduct. I am satisfied that the matters addressed in this statement of evidence are within my expertise. I am not aware of any material facts that have been omitted or might alter or detract from the opinions expressed in this statement of evidence.

Role in Project

[7] I have been involved in the Douglas Links project since July 2020, providing resource management and planning support and advice to the project team.

[8] I prepared the Assessment of Environmental Effects (AEE) and supporting documents for the resource consent applications to both Horizons Regional Council (Horizons) and Horowhenua District Council (HDC) for the proposed activities. I also undertook an assessment of the proposed activities against the relevant national, regional and district policy documents.

Scope and purpose of Evidence

[9] My statement of evidence provides an assessment of the proposed activities that are the subject of this hearing against the relevant provisions of the Horizons One Plan and against the requirements of Sections 104 and 104D of the Resource Management Act 1991 (RMA).

[10] I include consideration of the proposed activities against the relevant provisions of the New Zealand Coastal Policy Statement 2010 (NZCPS) and the National Policy Statement for Freshwater Management 2020 (NPS-FM).

[11] In preparing this evidence, I have reviewed, in particular, the following documents:

a) NZCPS;

b) NPS-FM;

c) Horizons One Plan;

d) Resource consent application documents, supporting and further information prepared for the Applicant;

e) Submissions received in support of, and opposition to, the resource consent applications; and

f) Reports prepared for Horizons under Section 42A of the RMA.

[12] Resource consent has already been granted by HDC for the district matters (including to establish a commercial golf course; construct a clubhouse, ten two-bedroom accommodation units, driving range building and ancillary structures; and undertake earthworks).

[13] Matters relating to land use, built form and earthworks (under HDC jurisdiction) are resolved, and I have not included these matters in my evidence as they are already determined.

Section B – Executive Summary

[14] I have assessed the proposed activities against the policy documents I consider to be relevant. In my opinion the proposed activities are not contrary to the relevant objectives and policies of those documents.

[15] I have assessed the adverse effects of the proposed activities and consider them to be minor. I consider the proposed activities will result in positive effects for coastal restoration and rehabilitation and public access to the coast.

[16] Iterations to the course design and associated activities proposed have resulted in a layout that, on the advice of the experts involved in the process, will protect the Schedule F values and provide additional enhancements whilst achieving the world class links golf course required to make the proposal a success.

[17] A draft restoration plan has been proposed by the Applicant that will lock in significant benefits to what has been described as a degraded coastal environment.

[18] I have reviewed and recommended some changes to the proposed conditions of consent.

[19] I conclude that the proposed activities can pass the gateway test of Section 104D, are consistent with the purpose of the RMA and therefore resource consent can be granted.

Section C – Evidence

[20] The activities for which consent is sought are listed in the application and the notification documents and include:

- Discharge consents for:

  (a) The discharge of treated domestic wastewater (discretionary activity – One Plan Rule 14-30);

(b) the removal and replacement of moisture-retentive soils within a 100m setback from a natural wetland (non-complying activity – National Environmental Standards for Freshwater (NES-F) clause 52);

(c) the taking, use, damming, diversion, or discharge of water within a 100m setback from a natural wetland (non-complying activity – National Environmental Standards for Freshwater (NES-F) clause 54);

- Groundwater consent for the abstraction of 2,000m^3/day of groundwater at a rate of 26 litres per second (discretionary activity – One Plan Rule 16-9); and

- Land use consent for:

(a) earthworks outside the coastal foredune and any identified at-risk or rare habitats (controlled activity – One Plan Rule 13-2);

(b) earthworks and vegetation clearance within the coastal foredune but outside any identified at-risk or rare habitats (discretionary activity – One Plan Rule 13-7);

(c) earthworks and vegetation clearance within identified at-risk habitats (discretionary activity – One Plan Rule 13-8); and

(d) earthworks and vegetation clearance within identified rare habitats (non-complying activity – One Plan Rule 13-9).

[21] The policy documents I consider to be of most relevance to these activities are:

- NZCPS;

- NPS-FM; and

- Horizons One Plan (including the Regional Policy Statement and the Regional Plan).

New Zealand Coastal Policy Statement

[22] The NZCPS contains the policies intended to achieve the purpose of the RMA in relation to the coastal environment and bears relevance to the proposed activities, given the proximity of the application site to the coast.

[23] I provide a detailed assessment of the proposed activities against the relevant objectives and policies of the NZCPS at **Attachment 1** to this statement. In most cases, I have relied on the expert opinion of others in preparing this assessment. In particular, the opinion and evidence of Vaughan Keesing (for ecology), Frank Boffa (for landscape), Phil Tataurangi (for cultural matters), Jim Dahm (for coastal geomorphology) and Alex Johansen (for hydrogeology) have informed this assessment. A summary of my assessment and the relevant NZCPS objectives is provided below.

Objective 1

[24] Objective 1 seeks to safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems.

[25] I am reliant on the expertise of Jim Dahm concerning the integrity, form, functioning and resilience of the coastal environment and its ecosystems.

[26] The *Coastal Processes and Vegetation* report prepared by Jim Dahm of Eco Nomos Limited and submitted with the resource consent application states:

> *The area contains some natural dune and (to a lesser extent) estuarine ecosystems, which are presently in a degraded condition, often dominated by exotic vegetation. Nonetheless, these areas include rare, threatened and at-risk habitats. Care is required to balance golf course development with maintenance and restoration of these habitats. In general, the areas affected by the Links course are dominated by exotic vegetation with little to no native vegetation. Patches of kanuka scrubland within the course will largely be preserved. However, the seaward edge of the course does intrude into dune habitat with a significant native vegetation component. It is recommended that offset restoration focus on the dune habitat seaward of the course where, in my opinion, the greatest ecological gains can be*

obtained. The small area of estuarine wetland along the river margin of the property is not affected by the proposed course but also offers useful restoration opportunities.[1]

[27] As I will address later, the restoration opportunities recommend in this report have been captured in the draft restoration plan now proposed by the Applicant. The restoration and revegetation proposed, which is reliant on the proposed activities to make it a viable option for a landowner, provides the potential to restore what has been identified by Jim Dahm, Frank Boffa and Vaughan Keesing as degraded coastal buffers.

[28] Based on the above, and as supplemented later in my evidence, it is my view that:

- natural biological and physical processes in the coastal environment will be maintained and, in places enhanced;
- the dynamic, complex and interdependent nature of those coastal processes is recognised in the proposed activities and well provided for;
- indigenous coastal flora and fauna are protected and will not be adversely affected by the proposed activities;
- coastal water quality will be maintained; and
- the proposal is therefore consistent with NZCPS Objective 1.

Objective 2

[29] Objective 2 seeks to preserve the natural character of the coastal environment and protect natural features and landscape values.

[30] I rely on the expertise of Frank Boffa about the preservation of the natural character of the coastal environment and the protection of natural features and landscape values.

[1] Resource consent application, Volume 2, Appendix 7 – *Coastal processes and vegetation*, page 3

[31] The iterative course design process (which I will detail later) included changes requested by Frank Boffa to better provide for natural character and coastal landscape values. These changes have resulted in a design and layout that sensitively addresses the coastal environment.

[32] The coastal landscape on the property and on surrounding land has been heavily modified through productive land uses, including forestry and farming. The application documents included a Landscape Assessment prepared by Frank Boffa, which states that:

> *The reviewed assessment confirms that, in line with the District Plan assessment, there are no areas of outstanding natural character within the Douglas Links site. The District Plan also indicates there are no areas of outstanding natural character along the Horowhenua Coast. The review confirms that while there are areas of very high natural character within the Douglas Links site, there are no areas of outstanding natural character within the site. The areas identified in this assessment as having very high natural character include the active coastal foredune and the salt marsh wetland on the Ohau River.*[2]

[33] Schedule G to the One Plan identifies "*Parts of the Coastline of the Region*" as outstanding Natural Features or Landscapes, although the subject area is not listed specifically. The identified characteristics/values are:

i. *Visual and scenic characteristics, particularly its special coastal landscape features*

ii. *Coastal geological processes*

iii. *Ecological value, particularly the Whanganui, Whangaehu, Turakina, Rangitikei, Akitio, Ohau, Waikawa and Manawatu River estuaries as habitats for indigenous fauna*

iv. *Recreational value*

v. *Significance to tangata whenua*

vi. *Scientific and educational values*

[2] Resource consent application, Volume 2, Appendix 8 – *Landscape Assessment*, page 6

vii. Historic heritage, in particular historical importance, archaeological sites and high potential for archaeological site discovery.

[34] These matters are addressed throughout my evidence and the evidence of others.

[35] The assessment process undertaken by Frank Boffa in defining the landscape character of the coastal environment provided a more detailed definition of the areas of Outstanding Natural Landscape than that shown crudely (based on 1:50,000 scale mapping) on the HDC planning maps[3]. HDC has accepted this more detailed assessment.

[36] The policy framework seeks to avoid adverse effects on outstanding natural features and landscapes and avoid significant effects on other natural features and landscapes (NZCPS Policy 15).

[37] With reference specifically to the proposed works in the area of Esplanade Reserve on the western edge of the property, the Landscape Assessment states:

> *While three golf holes are in part sited within the adjacent Esplanade Reserve (holes 4, 16 and 17), this area is largely within the exotic treed area with very little undergrowth and/or biodiversity values. The intention is to replace the exotic trees and, as appropriate, carry out minor reshaping earthworks followed by revegetation as outlined in Mr Dahm's report in conjunction with the golf course grassland management proposed. The refined and combined high natural character area and the Coastal ONFL area which includes the stable dunes and the active foredune, also incorporates additional golf holes, namely holes 4, 12, part of 13, 15, and in part 3 and 11. The coastal dune restoration and rehabilitation measures proposed by Mr Dahm will extend as appropriate into these areas.*[4]

[38] The landscape assessment report concludes that:

> *… in terms of Coastal Environment considerations, the proposed development –*
>
> a) *Will preserve the natural character of the Coastal Environment.*

[3] Ibid pages 4-7
[4] Ibid. pages 8-9

b) *Will increase and enhance the levels of natural character throughout the site.*

c) *Recognises and respects the sensitivities and dynamics of the coastal dune landscape.*

d) *Embraces opportunities to restore and rehabilitate the natural character of the site and its adjacent coastal edge.*

That in terms of visual effects considerations, the proposed development –

a) *Will not create adverse visual or amenity effects from locations within or beyond the site.*

b) *Will enhance the visual amenity of the landscape in the context of its coastal setting.*[5]

[39] And that:

The proposed Douglas Links Golf Course will –

1. *Have no adverse effects on the environment that cannot be readily mitigated, and will in fact enhance the landscape character, biodiversity habitat and the amenity values of the coastal landscape.*

2. *Will restore and rehabilitate degraded and vulnerable landscapes and vegetation, particularly along the coastal margin.*

3. *Will protect and enhance natural character values throughout the site.*[6]

[40] As detailed in the assessment undertaken by Frank Boffa, adverse effects on outstanding natural features and landscapes and significant effects on other natural features and landscapes will be avoided by the final course design.

[41] Based on this assessment and the evidence of Frank Boffa I consider the proposal to be consistent with NZCPS Objective 2 and associated policies.

[5] Ibid. pages 9-10
[6] Ibid. page 11

Objective 3

[42] Objective 3 seeks to take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment.

[43] The Applicant has established an ongoing relationship with Ngāti Kikopiri in a genuine effort to recognise the role of tangata whenua as kaitiaki and to provide for tangata whenua involvement in the ongoing management of the coastal environment.

[44] The evidence of Phil Tataurangi further addresses tangata whenua involvement in the management of the coastal environment.

Objective 4

[45] Objective 4 seeks to maintain and enhance the public open space qualities and recreation opportunities of the coastal environment.

[46] The stretch of Horowhenua coast in this area currently has no formal public access between Hokio Beach and Waikawa Beach.

[47] Public access and open space in the coastal environment will be improved as a result of the proposed activities through the provision of an improved pedestrian walkway from Muhunoa West Road to the coast. This public access has been secured through the district council's consents but will only be achieved by granting the full suite of consents required to give effect to the proposal. As such, the regional consents are critical to the achievement of improved public access to the coast. Recreation opportunities along the coast will be enhanced by the provision of this improved public access. This approach is consistent with Objective 4 and Policies 18 and 19 of the NZCPS. As the public access proposed is pedestrian-only, it is also consistent with Policy 20.

[48] Recreation opportunities on the property will be enhanced through the conversion of the land use on the property from farming to golf.

Objective 5

[49] Objective 5 seeks to ensure that coastal hazard risks, taking account of climate change, are managed.

[50] The potential implications of climate change have been considered in the Eco Nomos report submitted with the resource consent application and in the evidence of Jim Dahm.

[51] Those documents show that the coastal hazard risk (taking account of climate change) is not likely to pose a threat to the proposed golf course over the next 100 years, based on best present information on projected future sea-level rise over that period.

Objective 6

[52] Objective 6 seeks to enable people and communities to provide for their social, economic, and cultural wellbeing and their health and safety, through subdivision, use, and development.

[53] The proposed activities will enable the construction and operation of the golf course (that has already been consented by HDC). This will provide social and economic benefits through opportunities for employment, tourism and economic development within the golf, hospitality and tourism sectors.

[54] The submissions in support of the proposed activities from within the golf sector attest to the benefits in this regard.

[55] As detailed elsewhere in my evidence and the evidence of others, these social and economic benefits can be achieved by the proposed activities whilst ensuring the identified values of the coastal environment are protected and enhanced through a programme of weed removal, native revegetation, good custodianship and course management and dune recontouring.

NZCPS Summary

[56] My assessment concludes that the proposed regional activities are not contrary to the relevant objectives and policies of the NZCPS.

National Policy Statement for Freshwater Management 2020

[57] I provide a detailed assessment of the proposed activities against the objective and relevant policies of the NPS-FM at **Attachment 1** to this statement. Again, where relevant I have relied on the expert opinion of others in preparing this assessment.

[58] The objective of the NPS-FM is to ensure that natural and physical resources are managed in a way that prioritises:

a) *first, the health and well-being of water bodies and freshwater ecosystems*

b) *second, the health needs of people (such as drinking water)*

c) *third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.*

[59] A summary of the proposed activities' consistent with this objective and the relevant policies is provided below.

[60] The policy considerations below and against the policies of the One Plan provide an assessment of the impacts of the proposed activities on the health and well-being of water bodies and freshwater ecosystems. The evidence of Vaughan Keesing also addresses this matter.

[61] The health needs of people will not be adversely affected by the proposed activities. Potable water supply to the proposed ancillary buildings can be provided without affecting existing water supplies. The ecosystem and habitat value of the Ōhau River will be protected through, amongst other things: (a) the avoidance of discharges to the river and to land where it could reach the river; (b) the confirmation (see the evidence of Alexandra Johansen) that the proposed irrigation water take will not affect surface water bodies or their flows; and (c) the removal of the land from other possible productive land uses (including plantation forestry and farming) which have the potential to affect the quality of water bodies to a greater extent than the proposed activities. Consequently, the river's values as a gathering area for mahinga kai will not be affected. I therefore consider the health needs of people will be provided for by the proposed activities.

[62] The ability of people to provide for their social, economic, and cultural well-being is discussed later in my evidence and in the evidence of others. The proposed activities will not hinder this ability.

[63] I consider the proposed activities to be consistent with the objective of the NPS-FM.

Policy 2

[64] As part of the development process, the Applicant engaged with iwi, including Ngāti Kikopiri. The engagement with iwi and Ngāti Kikopiri, and the Cultural Values Assessment, conveyed to the Applicant by Ngāti Kikopiri, outlined an inter-related nature between some groups in the area. I understand that the Applicant intends to continue to consult with and discuss opportunities for iwi throughout the development of the proposed activities.

[65] The Memorandum of Understanding (MoU) between the Applicant and Ngāti Kikopiri provides for this ongoing engagement.

[66] The Applicant is keen to continue to involve tangata whenua in the development of the land and water in a way that identifies and provides for their values.

[67] The evidence of Phil Tataurangi further addresses this.

Policy 3

[68] The Applicant has taken a whole of catchment approach when considering the effects of the proposed groundwater take and the potential for discharges to surface water (or where discharges could enter water).

[69] The evidence of Alexandra Johansen confirms that from a water quantity perspective, the proposed groundwater take will not result in allocation or recharge issues, nor will saltwater intrusion result from the proposed take.

[70] Construction approaches and on-going good management will ensure discharges resulting in uncontrolled adverse effects will be avoided.

Policy 6

[71] In the further information provided to Horizons on 14 September 2021 (a copy of which is at **Attachment 2**), Brendan Allen, the Head of Construction for the proposed golf course, states:

> *I believe the possibility of natural wetland drainage as a result of the golf course to be almost nonexistent.*
>
> *The native sandy soils on the site are very well suited to producing high quality firm and bouncy Fescue playing surfaces, and a key reason Grenadier Ltd is attracted to the site. Links golf courses are meant to be firm and dry. Sandy soils provide the free draining characteristics ideal for the construction of golf courses. Indeed, sand is frequently imported into golf courses to build greens and tees on and to be used as a topdressing medium to firm up surfaces. Grenadier will want to maintain wetland features to enhance the appeal of the wider golf landscape. Unlike the farms in the surrounding area there is no advantage to capturing moisture retentive soils to create 'productive' land.*
>
> *There will be no topsoil imported to site. Grenadier will be exclusively using the existing sands from the site and from the immediate surrounds of each specific zone. There should be no noticeable or measurable change in moisture retention. There are no upsides to Grenadier moving more moisture retentive soils into the areas meant for golf turf. Again, moisture retaining soils mean softer surfaces which lead to poorer playing conditions, extra growth to mow, and invasion of weed species grasses such as Poa Annua. Lower moisture soils encourage deeper root systems which can access natural rainfall and nutrients at depth better and leads to healthier grass requiring less fungicide and fertiliser.*
>
> *Grenadier will not be contouring to lead water away from the wetland.*
>
> *Additionally, the water level in the wetland is likely determined more by the level of the water table rather than runoff or seepage from surrounding soils.*
>
> *To meet the summer survival and health requirements of the Fescue turfgrass, Grenadier would potentially apply approximately 300mm of irrigation in the summer months when natural rainfall isn't frequent. I suspect that irrigation in the absence of rainfall would*

be more likely to enhance any wetland than detract from it, although the effect would be small enough to not be able to be measurable.[7]

[72] In the same further information request response, Boffa Miskell ecologists state:

…the raupo wetland pocket is best described as a swamp (Johnson and Gerbeaux 20041), and the vegetation components (mostly raupo) are very able to manage high nutrient loading (e.g. Pegman & Ogden 20052, Vymazal 20113) Raupo has high decomposition rates (3kg/m2/year) and high biomass production rates enabling it to utilise high nutrient loading.

We understand that fairway management should not cause additional nutrient leachate. However, we note also that current farm practices in relation to nutrient addition will cease and the inputs related to the raupo wetland may actually balance. We also understand Mr Allan, on behalf of Grenadier will be addressing this potential issue.

In respect to the salt marsh wetland, this feature is some distance from any fairway or green (a very small back green of one hole is near) and therefore there will be a substantive non-fertilised area between it and those activities; and in a predominantly sand substrate soils leachate of that distance is highly unlikely. Again, the Applicant is proposing rehabilitation planting at the buffer of this area to remove the past exotic forestry influence and the current agricultural use of the land. From an ecological perspective this is considered a positive resulting from the proposal on the salt marsh. We note the northern margin of the salt marsh has emerging gorse, pampus and rank exotic grass invading the area.[8]

[73] Based on the above, it is my view that the design of the golf course, including iterative design process and the construction and operation procedures designed to protect the natural wetlands on the property, is consistent with Policy 6.

[7] Letter from Brendan Allen dated 9 September 2021, provided to HRC on 14 September 2021
[8] Boffa Miskell memorandum *Douglas Limks Golf Course, Ohau – Section 92 responses – Ecology* dated 8 September 2021, provided to HRC on 14 September 2021. Page 6

Policy 7

[74] No river extent will be lost. River values will be protected through earthworks management and avoidance of discharges to the Ōhau River that might adversely affect those values. The proposed activities have been demonstrated to be consistent with Policy 7.

Policy 8

[75] Outstanding water bodies are those "*identified in a regional policy statement, a regional plan, or a water conservation order as having one or more outstanding values*".

[76] Schedule B to the Horizons One Plan does not identify the Ōhau River as having one or more outstanding values. As such, I do not consider Policy 8 of the NPS-FM to apply under the current planning framework.

Policy 9

[77] For reasons described elsewhere in my evidence and the evidence of others, I do not consider the proposed activities will adversely affect the water quality or the habitat values of existing water bodies on the site and in the surrounding area. I therefore consider the habitats of indigenous freshwater species will be protected in accordance with Policy 9.

Policy 10

[78] The lower Ōhau River is identified in Schedule B to the One Plan as an "*Other Trout Fishery*". I am not aware of any reason to consider the proposed activities will affect the habitat of trout or salmon.

Policy 11

[79] No over allocation of freshwater will result from the proposed activities. Although I understand surface water in the catchment is fully allocated, the pump test data and the assessment undertaken by Alexandra Johansen of Bay Geological Services Limited indicated that the proposed groundwater take is not hydrologically linked to surface water bodies and will have no effect on water quantity in surface bodies.

[80] I understand there is no allocation issue with groundwater supply in the subject aquifer, and recharge rates demonstrated from the pump test data were acceptable.

[81] I therefore consider the proposal to be consistent with Policy 11.

Policy 15

[82] The proposed activity has been demonstrated to be consistent with the NPS-FM and will enable the use of the property in a way that provides for the social, economic and cultural well-being of the local and wider communities.

NPS-FM summary

[83] My assessment concludes that the proposed regional activities are not contrary to the relevant objectives and policies of the NPS-FM.

Horizons One Plan

[84] I provide a detailed assessment of the proposed activities against the relevant policies of the One Plan (incorporating both the regional policy statement and regional plan) at **Attachment 1** to this statement. Again, where relevant I have relied on the expert opinion of others in preparing this assessment. A summary of my assessment and the relevant One Plan objectives is provided below.

Objective 2-1

[85] I understand the Applicant will continue to endeavour to establish a relationship with iwi and hapū and to ensure the relationship they have with their ancestral lands and resources is recognised and protected.

[86] The evidence of Phil Tataurangi further addresses this.

[87] Policy 2-2 seeks to:

> a) protect wāhi tapu, wāhi tūpuna and other sites of significance from inappropriate subdivision, use or development that would cause adverse effects on the qualities and features which contribute to the values of these sites;

b) facilitate hapū and iwi recording the locations of wāhi tapu, wāhi tūpuna and other sites of significance to Māori in a public format;

c) minimise potential damage or disturbance to unidentified sites by facilitating the compilation of databases to record locations which remain confidential; and

d) ensure that resource users and contractors have clear procedures in the event wāhi tapu or wāhi tūpuna are discovered.

[88] As confirmed in her evidence (and recognised in the Section 42A report), Mary O'Keefe undertook an archaeological assessment of the site and surrounds. The Applicant also engaged with iwi including Ngāti Kikopiri and sought a Cultural Values Assessment to better understand the presence of sites of significance.

[89] Policy 2-2(a) focuses on the protection of sites "*from inappropriate subdivision, use or development that would cause adverse effects on the qualities and features which contribute to the values of these sites*".

[90] The Section 42A report refers to Table 2.1. Policy 2.4 is of key relevance to Table 2.1. Policy 2.4 requires that the specific resource management issues listed are "*addressed in the manner set out in Table 2.1*". With respect to clauses (l) and (n) referred to in the Section 42A report, Table 2.1 requires that these are addressed through the provisions of Chapters 4, 6, 13 and 14 of the One Plan.

[91] These matters are addressed elsewhere in my evidence and in the evidence of others. I have concluded the proposed activities to be consistent with the provisions of these chapters.

[92] It is my understanding that, with the provision of the restoration plan proposed and the additional lizard monitoring presented in the evidence of Dr Keesing, the areas of disagreement between Horizons' and the Applicant's experts in relation to Chapters 6 and 13 have been resolved.

[93] I therefore consider the proposed activities to be in accordance with the approach sought in Table 2.1 and consistent with Policy 2.4.

Objective 4-2

[94] The resource consent application was accompanied by an engineering report that included a proposed erosion and sediment control plan (ESCP). That ESCP contained methods and measures to be implemented during construction activities. Adherence to the ESCP will ensure no activity will accelerate erosion or cause sediment loads to enter water bodies. I understand Horizons' advisors were satisfied with the proposed ESCP.

[95] The construction works are to be phased and managed in a way that will reduce the potential for windblown erosion and will protect the values of the identified and potential natural wetlands. Progressive stabilisation of the works will be employed to 'lock down' the desired landforms immediately after the recontouring. This approach is primarily used to secure the landform sought for the golf course but will also ensure the sandy soils are not lost to windblown erosion. No more than ~2 hectares of the property will be open at any one time. I consider this approach consistent with One Plan Objective 4-2 and its associated policies.

Objective 5-2

[96] Objective 5-2 seeks to manage the quality of the region's surface and groundwater to ensure the values in Schedule B to the One Plan are supported either through maintenance of existing quality or, if required enhancement of substandard quality.

[97] There will be no discharge of either sediment from earthworks or from discharge of treated domestic wastewater to surface water. Activities are either setback far enough from surface water or will be managed through the implementation of an approved erosion and sediment control plan to ensure no uncontrolled or accidental discharge to surface water occurs.

[98] I understand groundwater recharge rates from the pump test data are considered to be adequate and saltwater intrusion is not considered likely.

[99] I therefore consider the proposal to be consistent with One Plan Objective 5-2 and associated policies.

Objective 5-3

[100] Objective 5-3 seeks to ensure the quantity of surface and groundwater is managed in a way that meets needs while avoiding adverse effects as listed in the objective.

[101] No surface water take is proposed.

[102] The groundwater take sought is a product of the maximum flow rate of the pump test from the well drilled on site. A maximum flow rate of 16.07 litres per second was recorded and was limited by the performance constraints of the test pump. The Bay Geological Services report submitted with the application states that:

> "*It is considered that pumping the Applicant's Well at a constant rate of 16.07 l/s over 150 days is likely to result in tolerable well interference effects in deep gravel aquifer bores due to the available head of water, and effects on the environment are considered no more than minor. It should be noted that there are no other wells at this depth within the near vicinity of the pumped Well and therefore adverse effects on nearby bores is not expected.*"[9]

[103] As such, I consider the proposed take will not cause significant adverse effects on the long-term groundwater yield.

[104] The Bay Geological Services report also confirms:

> "*The confined nature of the aquifer producing from a deep gravel unit and the relatively low flow rate (16.06 l/s) resulting in moderate drawdown suggests that the risk of saline intrusion would be low*"[10]

[105] I therefore consider saltwater intrusion will be avoided.

[106] Potable water supply to the property will be supplemented by rainwater collection from roofs to reduce demand from groundwater.

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[9] Bay Geological Services Ltd *Douglas Links Well Aquifer Pump Test Report and AEE* (June 2021)
[10] *ibid*

[107] Based on the above, the assessment in the application documents and the evidence of Alexandra Johansen, I consider the proposal to be consistent with One Plan Objective 5-3.

Objective 5-4

[108] Objective 5-4 seeks to manage the beds of lakes and rivers in a manner that sustains life supporting capacity and provides for identified values.

[109] No change is proposed to the bed of any river of lake. For reasons already outlined, I do not consider there will be any increase in discharges to the bed of the Ōhau River. The river's natural character, including the saltmarsh wetland's natural character within the application property, will be maintained. There will be no effect on the provision for infrastructure or flood mitigation measures.

[110] I therefore consider the proposed activities to be consistent with One Plan Objective 5-4.

Objective 6-1

[111] Objective 6-1 seeks to protect significant indigenous vegetation and habitats of indigenous fauna, together with enhancement where appropriate.

[112] The Applicant requested that Horizons' ecologist undertake a site visit, report on and map areas of significant indigenous vegetation on the property. The findings of that report and the mapping of significant areas has informed and led the design of the golf course and the revegetation management plan for the property. The Applicant's ecologists (Boffa Miskell) have used the Horizons Schedule F assessment and further on-site investigations to provide finer grained Schedule F mapping for the site. The evidence of Vaughan Keesing better details the process and the findings of that assessment.

[113] The outcomes of the refined Boffa Miskell Schedule F mapping and the assessment is provided in the Boffa Miskell memorandum dated 22 November 2021 (at **Attachment 2**), which confirms:

> "*Community 5 was presented well in the AEE and is not representative in canopy or middle or ground tier of the expected native dune ridge and dune hollow communities.*

This is unsurprising given the extensive long term levels of modification. These areas do not fit schedule F criteria for while they have the geo-morphology of dune and dune hollow, they do not have the appropriate native vegetation of those communities, and are and will continued to be outside of the schedule F boundary. Furthermore, the plot and photo data show that the areas within the wider type 5 which were initially labelled type 9 knobbly club rush are not those but are actually exotic scrub and shrub and the map changes … now reflect this. Hole 14, active dune area is now recognised by plots as exotic scrub (lupin) and has virtually no representativeness value and is properly reflected in the mapping … and a new assessment of effect is presented which is an overall level of very low. No katipo were found in area 14 or the wider grid searches in other areas (katipo were found in wood debris outside of the subject area).

No lizards were found or seen and it remains strongly the observation that the heavy mouse and hedgehog populations observed in the critapics as well as the history of site modification, and absence in any in the initial survey method undertaken, is because there are only very low populations of northern grass skink and no other taxa. This presence (northern grass skink) in low abundance does not result in a value change from that already expressed, what it does is cause a need through the wildlife act to salvage these lizards if their habitat is to be sufficiently disturbed.

The impacts of the golf course as proposed are less than minor the level of effect on all communities affected is very low.

[The updated Schedule F mapping shows] … *that the restoration is in largely exotic low value communities and not in any valued indigenous dominated areas. This ensures the outcomes of the restoration are truly site beneficial and progressing communities that otherwise have not and would not gain additional indigenous dominance or habitat value.*"[11]

[114] Based on the extensive on-site assessment and mapping work undertaken by Boffa Miskell, in my opinion the identified areas of significant indigenous vegetation and significant habitats of indigenous fauna are protected and indigenous biological diversity is maintained and, where appropriate enhanced and the proposal is consistent with One Plan Objective 6-1 and its associated policies.

[11] Boffa Miskell memorandum dated 22 November 2021

Objective 6-2

[115] Objective 6-2 is focused on the protection, rehabilitation and restoration of outstanding natural features, landscapes and natural character.

[116] As I have already detailed, the landscape assessment prepared by Frank Boffa and submitted with the application states that:

> *The reviewed assessment confirms that in line with the District Plan assessment, there are no areas of outstanding natural character within the Douglas Links site. The District Plan also indicates there are no areas of outstanding natural character along the Horowhenua Coast. The review confirms that while there are areas of very high natural character within the Douglas Links site, there are no areas of outstanding natural character within the site. The areas identified in this assessment as having very high natural character include the active coastal foredune and the salt marsh wetland on the Ohau River.*[12]

[117] And that:

> *… in terms of Coastal Environment considerations, the proposed development –*
>
> a) *Will preserve the natural character of the Coastal Environment.*
>
> b) *Will increase and enhance the levels of natural character throughout the site.*
>
> c) *Recognises and respects the sensitivities and dynamics of the coastal dune landscape.*
>
> d) *Embraces opportunities to restore and rehabilitate the natural character of the site and its adjacent coastal edge.*
>
> *That in terms of visual effects considerations, the proposed development –*
>
> a) *Will not create adverse visual or amenity effects from locations within or beyond the site.*

[12] Resource consent application, Volume 2, Appendix 8 – *Landscape Assessment*, page 6

b) *Will enhance the visual amenity of the landscape in the context of its coastal setting.*[13]

[118] Further, the *Coastal processes and vegetation report* advises that in the dune environment:

> *…restoration work to offset these losses should focus on the dune vegetation seaward of the proposed course. This work will have much higher ecological value than planting small patches of native vegetation within the course itself. The ecological benefits will also increase over time as the shoreline continues to extend seaward, widening the area of native dune vegetation and habitat by around 15-16m every decade. As noted above, at present, native-dominated communities are limited to the nearshore areas with serious (and, over time, increasing) weed invasion in the more landward areas.*[14]

[119] And that in the estuarine environment:

> *…restoration in this area focus on:*
>
> - *Improved management of existing vehicle use, ideally containing any use to a narrow defined track landward of the estuarine area and associated riparian vegetation*
> - *Restoration of a native riparian vegetation sequence around the landward margins of the saltmarsh, using such species as oioi, saltmarsh ribbonwood, and flax*
> - *Removal of exotic vegetation (particularly around the riparian margin and also the grass invasion of some parts of the saltmarsh).*

[120] Based on this advice it is my view that:

- No inappropriate use or development of outstanding natural features or landscapes will occur as a result of the proposed activities;
- Adverse effects on the natural character of the coastal environment (including cumulative effects) will be, for reasons I deal later, minor;

[13] Ibid. pages 9-10
[14] Resource consent application, Volume 2, Appendix 7 – *Coastal processes and vegetation*, page 17

- Restoration and revegetation activities that are an integral part of the proposed activities will rehabilitate and restore the natural character of the coastal environment; and

- The proposal is therefore consistent with Objective 6-2 and its associated policies.

Objective 9-1

[121] The adverse effects of natural hazard events on people, property, infrastructure and the well-being of communities was considered in the design of the proposal. No sensitive activities (such as accommodation units) have been placed in areas of high risk from natural hazard events.

[122] As detailed in the evidence of others, the proposed activities will not adversely affect the sensitive frontal dune area in which most serious wind erosion issues develop. In terms of coastal erosion, the *Coastal process and vegetation* report submitted with the application outlines how the shoreline in this area is moving seaward at a rate of at least 0.5-1m per year. Coastal erosion is therefore not considered to pose a risk to the application property[15].

[123] The report outlines estuarine erosion along the margins of the Ōhau River as follows:

> *Available data suggests that, over long periods of time, the rate of bank erosion averages about 1-2 m/yr. The erosion is probably episodic, with significant erosion possible during major flood events, with periods of much lesser erosion between such events. Any parts of the golf course (fairways, tees etc.) located close to the river margin may periodically need to be moved due to erosion. The areas likely to be at highest risk from erosion with existing channel geometry are identified.*[16]

[124] No golf course infrastructure is proposed in the existing channel geometry or in a location considered to be particularly susceptible to estuarine erosion. I consider the proposal to be consistent with Objective 9-1 and its associated policies.

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[15] Eco Nomos Limited. *Coastal processes and vegetation*. Page 3
[16] Ibid.

Objective 13-2

[125] Objective 13-2 seeks to protect, and enhance, where appropriate, areas of indigenous biological diversity by regulating activities that may affect it.

[126] I have already addressed the measures proposed to protect significant indigenous vegetation and maintain indigenous biological diversity. The evidence of Vaughan Keesing also addresses this in greater detail. The golf course design has been through an iterative design process (as I will discuss later in my evidence) with many of the changes requested by members of the project team to protect and/or maintain sensitive of significant features, vegetation and biological diversity.

[127] As Dr Keesing, Boffa Miskell ecologists have provided a detailed delineation of Schedule F areas on site.

[128] Identified Schedule F habitat will predominately be protected throughout the construction and maintenance of the proposed golf course. As detailed in the Boffa Miskell 22 November 2021 memo, golf course activities are "*in largely exotic low value communities and not in any valued indigenous dominated areas*". Dr Keesing identifies some loss of Schedule F vegetation but assesses it as small in scale and less than minor in effect.

[129] The Boffa Miskell memorandum also states that "*the outcomes of the restoration are truly site beneficial and progressing communities that otherwise have not and would not gain additional indigenous dominance or habitat value.*"

[130] Policy 13-4(b) is particularly relevant for those parts of the proposed activities in Schedule F areas and states that:

> *Consent must generally not be granted for resource use activities in a rare habitat, threatened habitat or at-risk habitat assessed to be an area of significant indigenous vegetation or a significant habitat of indigenous fauna under Policy 13-5, unless:*
>
> *i. any more than minor adverse effects on that habitat's representativeness, rarity and distinctiveness, or ecological context assessed under Policy 13-5 are avoided.*
>
> *ii. where any more than minor adverse effects cannot reasonably be avoided, they are remedied or mitigated at the point where the adverse effect occurs.*

iii. where any more than minor adverse effects cannot reasonably be avoided, remedied or mitigated in accordance with (b)(i) and (ii), they are offset to result in a net indigenous biological diversity gain.

[131] On the expert advice of Dr Keesing and his team of ecologists, I consider the proposed activities meet Policy 13-4 given that:

i. More than minor adverse effects are avoided (meeting part (i)).

ii. Those effects that have been identified (as less than minor) will have been mitigated through on-site restoration and management within those areas (meeting part (ii) even though that is not required); and

iii. Net indigenous biological diversity gain will be provided as a result of the proposed activities as a result of the on-site restoration and rehabilitation proposed, including removal of weed and pest species from existing Schedule F areas (meeting part (iii) even though that is not required.

[132] It is my opinion that the iterative design process which has amended the course layout to that now proposed, combined with the "beneficial" restoration plan will ensure areas of significant indigenous vegetation and significant habitats of indigenous fauna are protected and indigenous biological diversity is maintained and enhanced. Consequently, I consider the proposed activities are consistent with Objective 13-2 and its underlying policies.

Objective 14-1

[133] Objective 14-1 seeks to manage discharges onto or into land or into water and land uses that may affect groundwater and surface water quality.

[134] Discharges to surface water will be avoided. The evidence of Vaughan Keesing, as well as the information provided in the further information to Horizons on 14 September 2021 (a copy of which is at **Attachment 2**) from course

construction manager Brendan Allen[17] address how good course management will ensure the proposed activities do not result in undesirable runoff.

[135] The retention of existing contours with only minor changes and on-site sandy soils will result in very little change from existing stormwater runoff flows and volumes.

[136] The grass varieties proposed have been selected partly for their ability to thrive in low moisture conditions. Standard golf course maintenance practices will maintain infiltration and avoid excessive runoff. Although it is likely the course grasses will be irrigated during dry periods, excess irrigation that would result in runoff is to be avoided as it produces undesirable soft playing surfaces.

[137] From a best practice golf course management perspective, undesired runoff is therefore to be avoided and will ensure consistency with Objective 14-1 and its underlying policies.

Objective 16-1

[138] Objective 16-1 seeks to regulate water takes, uses, and diversions.

[139] I have considered the proposed water take against the provisions of Chapter 5. The evidence of Alexandra Johansen confirms that the proposed water take will have no impact on surface water values, including those in Schedule B to the Horizons One Plan. I am therefore confident that the proposal is consistent with Objective 16-1 of the One Plan and its underlying policies.

One Plan summary

[140] My assessment concludes that the proposed regional activities are not contrary to the relevant objectives and policies of the One Plan.

[17] Memorandum dated 9 September 2021, submitted to Horizons on 14 September 2021

Summary of policy considerations

[141] My assessment of the proposed regional activities against the relevant national and regional policy documents concludes that these activities are not contrary to the relevant objectives and policies of those documents.

Assessment of effects

[142] The resource consent application contained a comprehensive AEE that considered the full range of actual and potential effects in accordance with Schedule 4 to the RMA. For the most part, that AEE remains relevant and valid and I do not intend to provide any further assessment in my evidence.

[143] Through the application process however, especially in the further information provided to Horizons, the AEE has been augmented and refined through further assessment and fieldwork.

[144] In particular, further information and assessment has been provided concerning ecological and hydrogeological matters, and some course changes have resulted (I deal with this latter).

Ecology

[145] A significant amount of further ecological assessment, fieldwork and site monitoring has been undertaken by the Applicant's team since the resource consent applications were lodged with Horizons. The evidence of Vaughan Keesing best addresses this additional assessment and the findings of that work.

[146] In particular, Boffa Miskell ecologists have further considered the effects of clearance or disturbance of vegetation in the active and stable dune features; effects on the identified saltmarsh and freshwater wetlands on the site; effects on the identified kanuka treeland on-site; and potential effects of earthworks and sedimentation of waterways from construction activities.

[147] Further monitoring and assessment of lizard and avifauna populations and habitats on site have confirmed, as Dr Keesing confirms, the effects of the proposed activities in this regard will be either less than minor or positive (when compared with alternative permitted land uses).

[148] The additional ecological assessment work (post lodgement of the consent applications) has also confirmed that:

a) The potential adverse effect of disturbance to wildlife through construction and operation via direct or indirect impacts is very low;

b) There will be no loss of threatened or at-risk species (katipo spider, sand daphne, kanuka and any at risk of threatened shore bird) as a result of the proposed activities;

c) Edge effects on indigenous habitats will reduce through the change of land use and removal of pest and invasive species; and

d) Habitat fragmentation from the proposed golf course activities will not occur around the saltmarsh wetland and the Ōhau River and will be minor within the active and stable dunes. The removal of macrocarpa (which restrict the establishment of indigenous dune communities) and the restoration planting proposed is likely to lead to a positive effect.

[149] Dr Keesing provides more detail on these matters in his evidence.

[150] Based on the original assessment with the resource consent applications, coupled with the further assessment undertaken by Boffa Miskell ecologists and the evidence of Dr Keesing, I consider the proposed activities will have minor adverse ecological effects and some positive ecological effects.

Hydrogeology

[151] Consent has been sought to take groundwater at a maximum instantaneous rate of 16.07 litres per second, which equates to a maximum volume of 1,388.45m^3 per day and 208,267.5m^3per year and accords with the maximum flow rate of the pump test from the well drilled on site.

[152] Consent was originally sought for 1,500-2,000m^3 per day, however this flow rate was limited by the performance constraints of the test pump. The Horizons reviewer of the application stated:

> *The volumes applied for are considered to be reasonable and efficient, based on the SPASMO estimates present, however based on the information provided it is unlikely that the daily and annual volumes proposed can be achieved by abstraction from the Applicant's bore. It is therefore recommended that the proposed daily and annual volumes are reduced to be consistent with the maximum instantaneous rate; this would equate to a maximum volume of 1,388.45m3/day (1,388) and 208,267.5m3/day (208,268). Alternatively, further testing could be undertaken on the Applicant's bore to assess whether it can achieve the pumping rates necessary to abstract the proposed daily and annual maximum volumes.*[18]

[153] The Applicant, at the recommendation of Horizons, therefore amended the proposal, as follows:

> *Following a review of the Douglas Links new well aquifer pump test analysis, the indication from Horizons is that the Application volume should reflect the capacity of the new 150 mm diam. well which was tested at 16.07 l/s for four days. Therefore, using this as the maximum instantaneous rate equates to a maximum daily volume of 1,388.45 m^3 and 208,267.5 m^3/year as recommended by Horizons.*[19]

[154] As confirmed by Horizons, "*The volumes applied for are considered to be reasonable and efficient*".

[155] As I have already addressed in my policy assessment, the Bay Geological Services report submitted with the application states that:

> "*It is considered that pumping the Applicant's Well at a constant rate of 16.07 l/s over 150 days is likely to result in tolerable well interference effects in deep gravel aquifer bores due to the available head of water, and effects on the environment are considered no more than minor. It should be noted that there are no other wells at this depth within the near vicinity of the pumped Well and therefore adverse effects on nearby bores is not expected.*"[20]

[156] It therefore appears the proposed take will not cause significant adverse effects on the long-term groundwater yield.

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[18] Horizons Regional Council, Further information request letter dated 1 September 2021
[19] Bay Geological Services letter dated 7 September 2021, submitted to Horizons Regional Council on 14 September 2021
[20] Bay Geological Services Ltd *Douglas Links Well Aquifer Pump Test Report and AEE* (June 2021)

[157] The Bay Geological Services report also confirms:

> "*The confined nature of the aquifer producing from a deep gravel unit and the relatively low flow rate (16.06 l/s) resulting in moderate drawdown suggests that the risk of saline intrusion would be low*"[21]

[158] I therefore consider saltwater intrusion will be avoided.

[159] Based on this, and the evidence of Alexandra Johansen, I consider the hydrological effects of the proposed activity, including on the quality and quantity of surrounding aquifers and surface waterbodies, will be minor.

Other environmental effects

[160] In relation to other environmental effects, it is my opinion that the assessment of effects provided with the original resource consent application documents remains valid.

[161] Where necessary, the evidence of other experts for the Applicant summarises this.

Consideration of benefits and positive effects

[162] Below I outline the principal benefits of the proposed activities, and positive effects resulting from them.

[163] Social and economic benefits, including employment opportunities during construction and operation of the proposed golf course, and indirect economic development effects, will result from the golf course in this location. I understand the provision of opportunities for local people to be employed directly and indirectly by the golf course is an important consideration for the Applicant.

[164] The proposed activities provide for better public access to the coast, a major benefit in terms of national, regional and local coastal policy. I have detailed this positive effect already in my evidence.

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[21] *ibid*

[165] On site restoration and rehabilitation of areas of degraded coastal buffers are detailed more fully below. In summary, the proposed activities will provide a series of environmental enhancements including:

- Removal of the existing macrocarpa and other exotic, invasive species from the coastal dunelands;
- Replanting of the majority of these areas with suitable native species that will both stabilise the dunelands and return the vegetation cover to its natural state;
- Augmentation of existing isolated stands of kanuka across the property with additional planting around the isolated remnants; and
- On-going protection of identified valuable habitats and ecosystems (including the saltmarsh wetland, kanuka remnants and coastal foredunes).

On site restoration

[166] As identified in the assessment and evidence of the Applicant's experts, there is significant opportunity to restore and rehabilitate areas of the degraded coastal environment through a comprehensive development and restoration programme associated with the proposed activities.

[167] The Applicant's project team has prepared a more detailed restoration plan based on the RBT Design *Ecological Restoration Plan* submitted with the original resource consent applications.

[168] Dr Keesing has provided a copy of a draft restoration plan with his evidence. The restoration plan is focused on:

a) Removal of pine, scrub and macrocarpa in the areas to be re-vegetated and restored;

b) Revegetation of species compatible with each other, existing habitats and landforms;

c) Weed control; and

d) Surveillance and monitoring.

[169] The draft restoration plan provides a five-year programme for the above activities, running concurrently with development of the proposed golf course.

[170] The draft restoration plan provides advice and recommendations on the management of the foredune area, in particular regarding restricting access and the management of pest and predator species. I consider these recommendations should be implemented by the Applicant.

[171] The restoration proposed by the Applicant is at a level that could not feasibly be expected from other land uses. The proposed activities, therefore, provide an opportunity for this stretch of the Horowhenua coast to be rehabilitated with the removal of significant areas of weed and exotic species and replacement with appropriate native species.

Cultural impacts

[172] For cultural matters, whilst I provided an assessment against the relevant objectives and policies of the Te Ao Māori chapter of the Horizons One Plan, I am largely reliant on the expertise of others, especially Phil Tataurangi for the Applicant to advise on these matters.

[173] In preparing the resource consent applications I was informed by the Cultural Impact Assessment prepared by Phil Tataurangi and by the Memorandum of Understanding between the Applicant and Ngāti Kikopiri Māori Marae Committee Incorporated Society.

[174] I note that many of the land use aspirations for the land outlined in the submission of Te Iwi o Ngāti Tukorehe Trust are encapsulated in the restoration plan prepared for the Applicant and that Dr Keesing has provided a list of species that could be considered suitable. I recognise there is a difference in views on appropriate land uses for the property.

Permitted baseline

[175] There are a number of uses of the site that could be undertaken as permitted activities (under district and regional plans and national regulations). I believe some consideration of these permitted uses is of assistance in this case.

[176] Alternative land uses that could be undertaken as a permitted activity on the land include farming, grazing and plantation forestry. I understand all these land uses have occurred on the property in the last 10 years.

[177] Given the size and value of the application property, I consider it likely the land would be used for some form of economic return if the proposed golf course is not constructed. As such, I do not believe consideration of the permitted baseline to be fanciful in this case.

[178] Primary production activities (agricultural, horticultural, floricultural, arboricultural, plantation forestry or intensive farming activity) are permitted activities in the Horowhenua District Plan.

[179] With the exception of the coastal foredune area, the application property is contained within the Green Zone under the National Environmental Standards for Plantation Forestry (NES-PF). Plantation forestry activities could be undertaken on the site as a permitted activity.

[180] Agricultural activities, provided they comply with the relevant permitted activity standards of the Horizons One Plan, could also be undertaken as a permitted activity.

[181] I have detailed the significant positive effects associated with the proposed activities, including the revegetation and restoration of coastal buffers along both the estuarine and ocean margins. The golf course activity, with the planting and restoration plan incorporated, offers significant opportunity for the restoration of what Jim Dahm describes as badly degraded natural coastal buffers. Such restoration would not be achieved through permitted plantation forestry or agricultural uses.

Consideration of alternatives

[182] Turning to potential alternative golf course layouts or designs, the Fourth Schedule to the RMA only requires an assessment of possible alternative locations for the activities where there will be significant adverse effects. In this case the application documents and the evidence of the Applicant's experts does not conclude there will be significant adverse effects.

[183] Notwithstanding this, I consider some consideration of the possible alternative designs and the design process already completed is relevant.

[184] The currently proposed layout has been the subject of a robust and iterative review process with the project team significant input from technical experts, including Dr Boffa (for landscape and natural character) and Jim Dahm (from a coastal geomorphological perspective). That has resulted in a number of changes to the course design to date, as shown in the drawing 'Course Layout Iterations' at **Attachment 3** and described below.

Change	**Reason/description**
A	Hole and fairway redesigned to avoid a natural wetland identified by Boffa Miskell.
B	Fairway and tee rerouting to avoid removal of a stand of kanuka. The course layout and design were amended due to input from Jim Dahm and Boffa Miskell.
C	Area C was removed from proposed Fairway 3 and Hole 3 for the same reasons as 'B' above. The hole was also relocated to better provide public access to the coastal margin.
D	The fairways for Fairways 4 and 17 were narrowed at the request of Frank Boffa. His reasons for requesting this were natural character related.
E	The hole and fairway for Hole 14 was amended at the recommendation of Frank Boffa. The hole is now in a location where weed species can be removed.

[185] The consideration of alternatives has been at the forefront of the design iteration process throughout and has resulted in a development proposal that has been very cognisant of the valued features on the property, including Schedule F habitat, and has protected those features.

[186] The evidence of Darius Oliver outlines the importance of the proposed layout to achieve the quality of golf course required to make the proposed activity viable and worthwhile.

[187] Without the world class aspects of the course I understand the proposed layout and design will achieve, the opportunity for the levels of restoration offered in the design would be missed. I therefore consider the proposed layout to achieve an appropriate balance between golf course amenity and restoration of the coastal margins whilst avoiding adverse effects that are more than minor.

Cumulative effects

[188] I consider an assessment of the potential for cumulative effects is appropriate, particularly concerning the effects on the coastal environment, existing wetlands and groundwater quality and quantity.

[189] Cumulative effects arise when effects that might be minor and acceptable alone combine to produce a more pronounced and potentially significant or unacceptable effect.

[190] The existing coastal environment has been described in the evidence of others (in particular by Vaughan Keesing, Frank Boffa and Jim Dahm). As detailed by others, the existing coastal buffers, both along the coastal edge of the application property and the wider Horowhenua coast, are generally in a degraded state having been used for a range of productive land uses (such as plantation forestry and dairy farming) for some time.

[191] The proposed activities will provide the opportunity for revegetation and restoration of coastal buffers along both the estuarine and ocean margins. This is shown in the restoration plan provided by Dr Keesing. It is my opinion that this opportunity, which would be difficult to achieve without the associated golf course proposal, would be a benefit to the coastal margin of the Horowhenua coast with

respect to removal of weed species, planting of ecologically appropriate species and long term custodianship and management responsibility for the coastal buffers.

[192] There has been much consideration by the project team on the measures proposed to protect the existing wetlands identified on site, including the saltmarsh wetland adjacent to the Ōhau River and the small raupo wetland at the northern end of the property. Potential effects on the wetlands include sedimentation from earthwork processes, additional run-off or groundwater leaching from irrigation or nutrient imbalances from fertiliser discharges.

[193] All these matters are best addressed in the Boffa Miskell memorandum submitted with further information to Horizons on 7 December 2021[22] (a copy of which is at **Attachment 2**) and confirm that:

a) "*there will be no significant change in runoff direction or rate compared to the current situation (and little risk of "sediment" loss at construction)*";

b) "*risk of run off or shallow groundwater leaching to either wetland is virtually zero*"; and

c) "*Phosphorus is generally considered the nutrient of greatest concern for wetlands. Fescues can be established with negligible levels of Phosphorus and maintained with almost none. It is highly likely that the conversion from farmland to golf course will see a significant reduction in the use of Phosphorus.*"

[194] In summary, management of the property as a links golf course will result in less fertiliser, and that which is applied will be less likely to adversely affect the wetlands, when compared with the historical farming use of the land.

[195] As detailed in the Bay Geological Services (BGS) report submitted with the resource consent application, there is an absence of existing groundwater bores in the area (hence the need to drill the 150mm diameter well on site for pump testing). The report confirms that:

[22] Boffa Miskell memorandum '*Ohau, Golf coure water nutrient and wetlands*' dated 2 December 2021.

> "*It should be noted that there are no other wells at this depth within the near vicinity of the pumped Well and therefore adverse effects on nearby bores is not expected.*"[23]

[196] Given the absence of other wells in the vicinity, the results of the pump test in the BGS report and the further information provided by BGS in response to a question from Horizons[24], I do not consider the proposed groundwater take will result in adverse cumulative effects on water quantity.

[197] I do not consider the proposed activities will result in more than minor adverse cumulative effects.

Summary of environmental effects

[198] I have taken the following into account in assessing the environmental effects of the proposed activities:

a) The original AEE submitted with the resource consent applications;

b) The further assessment and fieldwork undertaken for the Applicant post lodgement;

c) The information contained in the submissions in support of, and opposed to, the proposed activities (detailed later);

d) The evidence provided to the hearing panel from the Applicant's other experts; and

e) The additional information provided to the hearing panel (including the draft restoration plan and the draft conditions of consent (detailed later).

[199] My assessment includes consideration of positive and adverse effects; temporary and permanent effects; past, present, and future effects; and cumulative effects. It also considers both potential effects of high probability and potential effects of low probability but high potential impact.

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[23] Bay Geological Services Limited '*Douglas Links well Aquifer Pump Test Report and AEE*' dated June 2021

[24] Bay Geological Services Limited letter dated 7 September 2021

[200] Taking the above into account, I consider the environmental effects of the proposed activities largely remain consistent with that presented in the original consent application and will be minor.

[201] Where further information has been provided, it is my view that this information has either confirmed the level of effects represented in the consent application or has refined the assessment to the extent that the adverse effects are lesser in scale.

[202] Overall, I consider the adverse effects of the proposed activities to be minor and that the proposed activities will generate or contribute to positive effects that would not be achievable from alternative uses of the application property.

Section 104D

[203] Some of the proposed activities are non-complying activities under the NES-F and the Horizons One Plan. Section 104D of the RMA is therefore relevant.

[204] Section 104D of the RMA is often referred to as the 'gateway test' for non-complying activities. If either of the gateways of the test can be passed (i.e. the adverse effects of the activity will be minor OR the activity is not contrary to the objectives and policies of relevant plans), then the application is eligible for approval. However, the proposed activity must still be considered under s104. There is no primacy given to either of the two gateways. If only test can be passed, that is sufficient.

[205] The resource consent application and appended technical documents provided a comprehensive assessment of environmental effects and an assessment against the relevant national and regional policy documents. Those documents, as summarised in my evidence, demonstrated that the proposed activities, both with and without the mitigation proposed, would result in no more than minor adverse environmental effects. It is also demonstrated that the activities are not contrary to the objectives and policies of the relevant plans.

[206] Those assessments have subsequently been augmented by further information and assessment through the consent process.

[207] In particular, ecology, coastal geomorphology and hydrogeology have been further assessed following the lodgement of the consent application. These matters are covered in the evidence of others and all cases have further demonstrated that the adverse environmental effects will be no more than minor and the activities are not contrary to the objectives and policies of the relevant plans.

[208] It has been demonstrated that both (a) the adverse effects of the proposed activities on the environment will be minor, and (b) the proposed activities are not contrary to the relevant objectives and policies of the relevant plans. I consider the proposed activities pass both gateway tests of Section 104D and the application can be considered for approval under Section 104.

Section 104 Consideration of applications

[209] Having considered the activities against the specific requirements of Section 104D, I now consider the proposed activities against Section 104. Section 104 provides the framework, subject to Part 2 of the RMA, for the consideration of resource consent applications. I consider the matters to be addressed in turn.

Part 2 – Purpose and Principles

Section 5 - Purpose

[210] Section 5 defines "sustainable management" as:

> "*managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enable people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while-*
>
> *(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
>
> *(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

[211] It is shown throughout my evidence and in the evidence of other experts for the Applicant that the proposed activities will not be contrary to the purpose

of the RMA. The proposal demonstrates sustainable use and development of the site, providing a range of positive outcomes for the site and the wider community.

[212] The life-supporting capacity of air, water, soil and ecosystems will be safeguarded through a range of measures incorporated into the development proposal, as described elsewhere in this report.

[213] Any actual or potential adverse environmental effects can be avoided, remedied or mitigated in the manner described in the original application, as amended by the further information provided to Horizons and summarised in my evidence and the evidence of others.

Section 6 – Matters of National Importance

[214] In exercising its powers and functions under the RMA, consent authorities are required to recognise and provide for the matters of national importance listed in Section 6 of the RMA.

[215] The relevant Section 6 matters have been addressed through the assessment of environmental effects and policy assessment in the original application, as amended by the further information provided to Horizons and as summarised in my evidence and the evidence of others. A summary of the specific considerations against the provisions of Section 6 is provided below.

(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:

[216] As I have already detailed, the design of the proposed golf course and ancillary activities used a first-principles approach to protecting natural character (including the coastal environment, wetlands and the Ōhau River), natural features and landscapes considered to be outstanding or displaying significant value. That included using the existing district-level maps of features and landscapes and fine-tuning the definition of those features and landscapes with aerial mapping and on-site walkovers.

[217] Course design followed an iterative process involving all members of the project team with adjustments made where necessary and at the recommendation of the Applicant's experts to ensure features of value or significance are protected and/or enhanced.

[218] The Applicant also invited Horizons ecologists to map and assess habitats of ecological value on the site before developing the course design. Development of the golf course layout and design followed from this fine-grained site assessment has taken full account of the natural character, features and landscapes of significant value, and measures have been put in place to ensure those areas are protected from inappropriate use and development.

[219] In some cases, enhancement of those features will be generated by the proposal. Removing weed and exotic vegetation species within some of those features, replanting with native and more suitable species as shown in the draft restoration plan attached to Dr Keesing's evidence is an example of this. There is some augmentation of those areas through additional native plantings around the edges of the existing features of significant value on the property.

(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

[220] Areas of significant indigenous vegetation, particularly those identified as being rare, threatened or at risk in the Horizons ecological report and the further Boffa Miskell assessment, will be protected or enhanced through the proposed works, which include significant native revegetation planting on the property.

[221] As confirmed by Dr Keesing, no significant habitats of indigenous fauna will be adversely affected by the proposed activities.

(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:

[222] Public access to the coast will be enhanced by providing a walkway to the beach from the end of Muhunoa West Road. There will be no change to public access to other water bodies, including the Ōhau River, although the golf course activity adjacent to the river will provide greater access to the river.

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

[223] The Applicant has worked with Ngāti Kikopiri to better understand and appreciate their relationship to the land and water, sites, waahi tapu and other taonga and to ensure these relationships are not hindered by the proposed development.

[224] The Applicant is keen to continue to involve tangata whenua in the development of the land and water in a way that identifies and provides for their values.

[225] The evidence of Phil Tataurangi further addresses this.

(f) the protection of historic heritage from inappropriate subdivision, use, and development:

[226] Measures have been taken, as detailed elsewhere in this report, including the protection of identified sites of historic value and the preparation of an archaeological authority application, to ensure historic heritage is protected during and after the proposed development. The Applicant has worked, and will continue to work, with Ngāti Kikopiri regarding appropriate methods to recognise and interpret features of historic heritage value.

(g) the protection of protected customary rights:

[227] No customary rights will be affected by the proposal.

(h) the management of significant risks from natural hazards.

[228] The adverse effects of natural hazard events on people, property, infrastructure and the wellbeing of communities was considered in the design of the proposal. No sensitive activities (such as accommodation units) have been placed in areas of high risk from natural hazard events.

[229] No golf course infrastructure is proposed in the existing channel geometry or in a location considered to be particularly susceptible to estuarine erosion.

[230] The areas of the property identified as being susceptible to flooding will be managed to ensure there is no increase in risk from on-site flooding. No other natural hazards are considered to present significant risks to the proposal.

[231] Based on the above and the general assessment elsewhere in this report and its appendices, I consider the proposed activities are consistent with the relevant provisions of Section 6 of the RMA.

Section 7 – Other Matters

[232] The other matters the local authorities must have particular regard concerning managing the use, development and protection of natural and physical resources are listed in Section 7 of the RMA.

[233] The relevant matters in Section of the RMA are addressed through the assessment of environmental effects and policy assessment in the original application, as amended by the further information provided to Horizons and as summarised in my evidence and the evidence of others. Of particular relevance to the regional council consents:

(a) kaitiakitanga:

(aa) the ethic of stewardship:

[234] The success of the links golf course depends on protecting the intrinsic value of the land and water resource. It is in the Applicant's interests to undertake good natural resource management both for the benefit of the golf course development and in their role as guardians of the valuable resource. I understand the Applicant has endeavoured to develop a meaningful relationship with tangata whenua regarding the protection and guardianship of the land, the water and the natural environment.

[235] The project includes the replacement of exotic and weed vegetation species with suitable native species. The building of a links course on a sandy subsoil has minimal effect on the surrounding environment. The design incorporates the replanting, regeneration and rejuvenation of the coastal environment. The golf course design seeks to return the dunes to, and maintain them in, a natural state. No soil will be removed or brought to the site. Organic fertilisers will be used and

only the playing corridors (fairways and greens) will be watered to maintain grass growth.

[236] The grass type will be fescue, which is ideal for a coastal environment. On-site wastewater treatment will be to a high standard and there will be no discharge or drawing of waters into or out of the river. Building materials will be energy efficient and solar panels will be incorporated into the designs.

(b) the efficient use and development of natural and physical resources:

[237] I consider the proposed activity to be an efficient use and development of the land and other resources on the property and will enable the enjoyment of the coastal land resource, improved public access to the coast, enhancement of the native vegetation cover on the property and an appropriate activity on the property.

(d) intrinsic values of ecosystems:

[238] The evidence of Vaughan Keesing provides a comprehensive consideration of the intrinsic value of ecosystems on and around the site and an assessment of the effects of the proposed activities on those values, both with and without the proposed incorporated measures.

[239] Dr Keesing also makes a number of recommendations in relation to construction of the proposed golf course that will further protect ecosystems and their values. I understand the Applicant will accept all of Dr Keesing's recommendations.

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

[240] Phil Tataurangi prepared a Cultural Values Assessment in association with Ngāti Kikopiri Maori Marae Committee Incorporated Society before the submission of the resource consent application. A Memorandum of Understanding was also entered into by the Applicant and Ngāti Kikopiri Māori Marae Committee Incorporated Society.

[241] Ngāti Kikopiri has informed the Applicant of the inter-related nature between a number of groups in the area. The Applicant intends to continue to

consult with and discuss opportunities for iwi throughout the development of the proposed activities.

[242] The Memorandum of Understanding between the Applicant and Ngāti Kikopiri provides for this ongoing consultation, and I understand that the consultation is not limited to only that iwi.

(f) maintenance and enhancement of the quality of the environment:

[243] The existing environment, including the Ōhau River and its margins (including the identified saltmarsh wetland on site), existing degraded coastal buffer, the active and stable dunes on and adjoining the property and the raupo wetland on-site, has been assessed for quality and potential effects of the proposal on it.

[244] As has been demonstrated in the application documents, further information and statements of evidence, the quality of the environment will be maintained or enhanced by the proposed activities together with the incorporated mitigation measures proposed, including the proposed restoration and rehabilitation of the site shown in the draft restoration plan.

(g) any finite characteristics of natural and physical resources:

[245] The finite nature of existing resources has been addressed for the proposed water extraction, vegetation removal and replanting, earthworks and land use.

(i) the effects of climate change:

[246] The effects of climate change, particularly as they relate to coastal processes, are considered in the Eco Nomos report submitted with the original application and in the evidence of Jim Dahm.

Section 8 – Principles of the Treaty of Waitangi

[247] Section 8 of the RMA requires the local authority to take into account the principles of Te Tiriti o Waitangi when considering applications for resource consent.

[248] The Applicant has entered into ongoing discussions with tangata whenua regarding opportunities for working together, in the spirit of kotahitanga, to seek mutually beneficial outcomes in relation to the land and resource.

[249] A cultural report was prepared in conjunction with Ngāti Kikopiri and submitted with the application documents.

[250] In my opinion, the proposed activities represent good management, use and development of the natural and physical resource of the site and surrounds and will protect and enhance natural and physical resources that have, in many cases, been degraded by previous uses and activities.

Further Section 104 considerations

[251] I have provided an assessment of the actual and potential effects of the proposed activities. When combined with measures incorporated into the proposal to provide positive effects (in terms of Section 104(1)(ab)), I have found the adverse effects to be minor.

[252] I have provided an assessment of the positive environmental, social, recreational, public access, well-being and economic effects of the proposal.

[253] I have already provided a full assessment of the proposed activities against the relevant provisions of national environmental standards, national policy statements (including the NZ Coastal Policy Statement) and the Horizons One Plan (incorporating the regional policy statement and regional plan).

[254] In all regards, I have found the proposed activities to be not contrary to these documents.

[255] I am not aware of any other matters of relevance to the proposed activities that require consideration in the determination of these applications.

Summary of Section 104 consideration

[256] In considering the proposed activities against the provisions of Section 104, I conclude the proposed activities will achieve the purpose of the RMA, and consent can be granted.

Section 42A reports

[257] I have reviewed the reports prepared for Horizons under Section 42A. I agree with the majority of the Planning report. There are some points of disagreement. I have addressed these matters throughout my evidence. Specifically:

a) As I have already discussed, I consider the proposed activities follow the resource management approach set out in Table 2.1 of the One Plan and, based on the approach required by the One Plan, are not contrary to Policy 2-2 or Policy 2-4;

b) On the advice and evidence provided by Vaughan Keesing, Frank Boffa and Jim Dahm, I am of the opinion that the proposed activities are consistent with Objective 13-2 and Policies 13-3, 13-4 and 13-5;

c) On the advice and evidence of Vaughan Keesing, it appears that a number of the management plans referred to in draft conditions of consent are neither reasonable nor required for a resource management purpose;

d) Consequent to points (a) and (b), I consider the proposed activities are not contrary to the objectives and policies of the relevant plan;

e) I have assessed that the adverse effects of the proposed activities will be minor;

f) I therefore consider the proposed activities do pass the gateway test of Section 104D.

Consideration of submissions

[258] Nineteen submissions were received on the applications. Seventeen submissions were received in support of the proposed activities, and two submissions were received in opposition to the proposed activities (one of which was a late submission).

[259] I do not propose to address any matters raised in the submissions in support of the applications.

[260] The submissions in opposition to the proposed activities were received from:

- Te Iwi o Ngāti Tukorehe Trust inc Tahamata Incorporation; and
- Muaūpoko Tribal Authority Incorporated (late submission).

[261] The submission of Muaūpoko Tribal Authority (MTA) Incorporated refers to a lack of consultation between the Applicant and MTA. I consider this issue to be best addressed in legal submissions, but I understand the Applicant is and has been willing to engage with MTA further regarding the proposed activities.

[262] The submission of Te Iwi o Ngāti Tukorehe Trust inc Tahamata Incorporation relates to cultural, archaeological, ecological and coastal geomorphology and climate change matters. These matters are addressed in the evidence of others, specifically Phil Tataurangi, Mary O'Keeffe, Vaughan Keesing and Jim Dahm.

[263] I have summarised these matters in my evidence and provided an assessment of the proposed activities against relevant Part 2 matters, including Sections 6(e), 7(a) and (aa) and 8, based on the expert advice and evidence of others.

Conditions of consent

[264] In conjunction with the Applicant's other experts, I have reviewed the draft conditions of consent provided by Horizons' reporting officer and provide a track changed version of the conditions suggested to the hearing panel should the panel be minded to grant resource consent.

[265] The amended version of the resource consent conditions is at **Attachment 4** to my evidence.

Summary and conclusions

[266] I conclude that:

a. The proposed activities will result in no more than minor adverse environmental effects;

b. The proposed activities will provide for positive effects through the restoration and rehabilitation of areas of degraded coastal buffers and public access to the coast;

c. The proposed activities are not contrary to the objectives and policies of the relevant national and regional policy documents (including the NZCPS, the NPS-FM and the Horizons One Plan).

d. The proposed activities can pass the gateway test of Section 104D;

e. The proposed activities are consistent with the purpose of the RMA, and therefore resource consent can be granted.

Dated 12 April 2022

T P Bland

Attachment 1

Assessment of the proposed activities against the relevant provisions of:

- The New Zealand Coastal Policy Statement 2010
- The Freshwater National Policy Statement 2020
- The Horizons One Plan

NZ Coastal Policy Statement		
Reference	**Text**	**Comment**
Objective 1	To safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, including marine and intertidal areas, estuaries, dunes and land, by: • maintaining or enhancing natural biological and physical processes in the coastal environment and recognising their dynamic, complex and interdependent nature; • protecting representative or significant natural ecosystems and sites of biological importance and maintaining the diversity of New Zealand's indigenous coastal flora and fauna; and • maintaining coastal water quality, and enhancing it where it has deteriorated from what would otherwise be its natural condition, with significant adverse effects on ecology and habitat, because of discharges associated with human activity.	Objective 1 seeks to safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems. I am reliant on the expertise of Jim Dahm in relation to the integrity, form, functioning and resilience of the coastal environment and its ecosystems. The *Coastal Processes and Vegetation* report prepared by Jim Dahm of Eco Nomos Limited and submitted with the resource consent application states: *The area contains some natural dune and (to a lesser extent) estuarine ecosystems which are presently in a degraded condition, often dominated by exotic vegetation. Nonetheless, these areas include rare, threatened and at-risk habitats. Care is required to balance golf course development with maintenance and restoration of these habitats. In general, the areas affected by the Links course are dominated by exotic vegetation with little to no native vegetation. Patches of kanuka scrubland within the course will largely be preserved. However, the seaward edge of the course does intrude into dune habitat with a significant native vegetation component. It is recommended that offset restoration focus on the dune habitat seaward of the course where, in my opinion, the greatest ecological gains can be obtained. The small area of estuarine wetland along the river margin of the property is not affected by the proposed course but also offers useful restoration opportunities.* The restoration opportunities recommend in this report have been captured in the draft restoration plan now proposed by the Applicant. The restoration and revegetation proposed, which is reliant on the proposed activities to make it a viable option for a landowner, provides the potential to restore what have been identified by Jim Dahm, Frank Boffa and Vaughan Keesing as degraded coastal buffers.

		Based on the above, and as supplemented later in my evidence, it is my view that: • natural biological and physical processes in the coastal environment will be maintained and in places enhanced; • the dynamic, complex and interdependent nature of those coastal processes is recognised in the proposed activities and well provided for; • indigenous coastal flora and fauna are protected and will not be adversely affected by the proposed activities; • coastal water quality will be maintained; and • the proposal is therefore consistent with NZCPS Objective 1.
Objective 2	To preserve the natural character of the coastal environment and protect natural features and landscape values through: • recognising the characteristics and qualities that contribute to natural character, natural features and landscape values and their location and distribution; • identifying those areas where various forms of subdivision, use, and development would be inappropriate and protecting them from such activities; and • encouraging restoration of the coastal environment.	Objective 2 seeks to preserve the natural character of the coastal environment and protect natural features and landscape values. I am reliant on the expertise of Frank Boffa in relation to the preservation of the natural character of the coastal environment and the protection of natural features and landscape values. The iterative course design process included changes requested by Frank Boffa to better provide for natural character and coastal landscape values. These changes have resulted in a design and layout that sensitively addresses the coastal environment. The coastal landscape on the property and on surrounding land has been heavily modified through productive land uses, including forestry and farming. The application documents included a Landscape Assessment prepared by Frank Boffa which states that: *The reviewed assessment confirms that in line with the District Plan assessment, there are no areas of outstanding natural character within the Douglas Links site. The District Plan also indicates there are no areas of outstanding natural character along the Horowhenua Coast. The*

		review confirms that while there are areas of very high natural character within the Douglas Links site, there are no areas of outstanding natural character within the site. The areas identified in this assessment as having very high natural character include the active coastal foredune and the salt marsh wetland on the Ohau River. Schedule G to the One Plan identifies "*Parts of the Coastline of the Region*" as outstanding Natural Features or Landscapes, although the subject area is not listed specifically. The identified characteristics/values are: *i. Visual and scenic characteristics, particularly its special coastal landscape features* *ii. Coastal geological processes* *iii. Ecological value, particularly the Whanganui, Whangaehu, Turakina, Rangitikei, Akitio, Ohau, Waikawa and Manawatu River estuaries as habitats for indigenous fauna* *iv. Recreational value* *v. Significance to tangata whenua* *vi. Scientific and educational values* *vii. Historic heritage, in particular historical importance, archaeological sites and high potential for archaeological site discovery.* These matters are addressed throughout my evidence and the evidence of others. The assessment process undertaken by Frank Boffa in defining the landscape character of the coastal environment provided a more detailed definition of the areas of Outstanding Natural Landscape than that shown crudely (based on 1:50,000 scale mapping) on the HDC planning maps. HDC has accepted this more detailed assessment.

		The policy framework seeks to avoid adverse effects on outstanding natural features and landscapes and avoid significant effects on other natural features and landscapes (NZCPS Policy 15). With reference specifically to the proposed works in the area of Esplanade Reserve on the western edge of the property, the Landscape Assessment states: *While three golf holes are in part sited within the adjacent Esplanade Reserve (holes 4, 16 and 17), this area is largely within the exotic treed area with very little undergrowth and/or biodiversity values. The intention is to replace the exotic trees and, as appropriate, carry out minor reshaping earthworks followed by revegetation as outlined in Mr Dahm's report in conjunction with the golf course grassland management proposed. The refined and combined high natural character area and the Coastal ONFL area which includes the stable dunes and the active foredune, also incorporates additional golf holes, namely holes 4, 12, part of 13, 15, and in part 3 and 11. The coastal dune restoration and rehabilitation measures proposed by Mr Dahm will extend as appropriate into these areas.* The landscape assessment report concludes that: *… in terms of Coastal Environment considerations, the proposed development –* a) *Will preserve the natural character of the Coastal Environment.* b) *Will increase and enhance the levels of natural character throughout the site.* c) *Recognises and respects the sensitivities and dynamics of the coastal dune landscape.* d) *Embraces opportunities to restore and rehabilitate the natural character of the site and its adjacent coastal edge.*

		That in terms of visual effects considerations, the proposed development – a) *Will not create adverse visual or amenity effects from locations within or beyond the site.* b) *Will enhance the visual amenity of the landscape in the context of its coastal setting.* And that: *The proposed Douglas Links Golf Course will –* 1. *Have no adverse effects on the environment that cannot be readily mitigated, and will in fact enhance the landscape character, biodiversity habitat and the amenity values of the coastal landscape.* 2. *Will restore and rehabilitate degraded and vulnerable landscapes and vegetation, particularly along the coastal margin.* 3. *Will protect and enhance natural character values throughout the site.* As detailed in the assessment undertaken by Frank Boffa, adverse effects on outstanding natural features and landscapes and significant effects on other natural features and landscapes will be avoided by the final course design. Based on this assessment and the evidence of Frank Boffa I consider the proposal to be consistent with NZCPS Objective 2 and associated policies. The assessment of effects and assessment against NZCPS and regional and district plan policy sets out how the proposal has been designed and has incorporated mitigation measures preserve the natural character of the coastal environment and protect natural features and landscape values.

Objective 3	To take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment by: • recognising the ongoing and enduring relationship of tangata whenua over their lands, rohe and resources; • promoting meaningful relationships and interactions between tangata whenua and persons exercising functions and powers under the Act; • incorporating mātauranga Māori into sustainable management practices; and • recognising and protecting characteristics of the coastal environment that are of special value to tangata whenua.	Objective 3 seeks to take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment. The Applicant has established an ongoing relationship with Ngāti Kikopiri in a genuine effort to recognise the role of tangata whenua as kaitiaki and to provide for tangata whenua involvement in the ongoing management of the coastal environment. The evidence of Phil Tataurangi further addresses tangata whenua involvement in the management of the coastal environment.
Objective 4	To maintain and enhance the public open space qualities and recreation opportunities of the coastal environment by: • recognising that the coastal marine area is an extensive area of public space for the public to use and enjoy; • maintaining and enhancing public walking access to and along the coastal marine area without charge, and where there are exceptional reasons that mean this is not practicable providing alternative linking access close to the coastal marine area; and • recognising the potential for coastal processes, including those likely to be affected by climate change, to restrict access to the coastal environment and the need to ensure that public access is maintained even when the coastal marine area advances inland.	Objective 4 seeks to maintain and enhance the public open space qualities and recreation opportunities of the coastal environment. The stretch of Horowhenua coast in this area currently has no formal public access between Hokio Beach and Waikawa Beach. Public access and open space in the coastal environment will be improved as a result of the proposed activities through the provision of an improved pedestrian walkway from Muhunoa West Road to the coast. This public access has been secured through the district council consents but will only be achieved through the granting of the full suite of consents required to give effect to the proposal. As such, the regional consents are critical to the achievement of improved public access to the coast. Recreation opportunities along the coast will be enhanced by the provision of this improved public access. This approach is consistent with Objective 4 and Policies 18 and 19 of the NZCPS. As the public access proposed is pedestrian only, it is also consistent with Policy 20.

		Recreation opportunities on the property will be enhanced through the conversion of the land use on the property from farming to golf.
Objective 5	To ensure that coastal hazard risks taking account of climate change, are managed by: • locating new development away from areas prone to such risks; • considering responses, including managed retreat, for existing development in this situation; and • protecting or restoring natural defences to coastal hazards.	Objective 5 seeks to ensure that coastal hazard risks, taking account of climate change, are managed. The potential implications of climate change have been considered in the Eco Nomos report submitted with the resource consent application and in the evidence of Jim Dahm. In those documents it is presented that the coastal hazard risk (taking account of climate change) is not likely to pose a threat to the proposed golf course over the next 100 years, based on best present information on projected future sea level rise over that period.
Objective 6	To enable people and communities to provide for their social, economic, and cultural wellbeing and their health and safety, through subdivision, use, and development, recognising that: • the protection of the values of the coastal environment does not preclude use and development in appropriate places and forms, and within appropriate limits; • some uses and developments which depend upon the use of natural and physical resources in the coastal environment are important to the social, economic and cultural wellbeing of people and communities; • functionally some uses and developments can only be located on the coast or in the coastal marine area; • the coastal environment contains renewable energy resources of significant value; • the protection of habitats of living marine resources contributes to the social, economic and cultural wellbeing of people and communities;	Objective 6 seeks to enable people and communities to provide for their social, economic, and cultural wellbeing and their health and safety, through subdivision, use, and development. The proposed activities will enable the construction and operation of the golf course (that has already been consented by HDC). This will provide social and economic benefits through opportunities for employment, tourism and economic development within the golf hospitality and tourism sectors. The submissions in support of the proposed activities from within the golf sector attest to the benefits in this regard. As detailed elsewhere in my evidence and the evidence of others, these social and economic benefits can be achieved by the proposed activities whilst ensuring the identified values of the coastal environment are protected and enhanced through a programme of weed removal, native revegetation, good custodianship and course management and dune recontouring.

	• the potential to protect, use, and develop natural and physical resources in the coastal marine area should not be compromised by activities on land; • the proportion of the coastal marine area under any formal protection is small and therefore management under the Act is an important means by which the natural resources of the coastal marine area can be protected; and • historic heritage in the coastal environment is extensive but not fully known, and vulnerable to loss or damage from inappropriate subdivision, use, and development.	
Objective 7	To ensure that management of the coastal environment recognises and provides for New Zealand's international obligations regarding the coastal environment, including the coastal marine area.	The proposal will have no impact on New Zealand's international obligations regarding the coastal environment.
Policy 1 Extent and characteristics of the coastal environment	1. Recognise that the extent and characteristics of the coastal environment vary from region to region and locality to locality; and the issues that arise may have different effects in different localities. 2. Recognise that the coastal environment includes: a. the coastal marine area; b. islands within the coastal marine area; c. areas where coastal processes, influences or qualities are significant, including coastal lakes, lagoons, tidal estuaries, saltmarshes, coastal wetlands, and the margins of these; d. areas at risk from coastal hazards;	As part of the development process for the proposed activity, the project team reviewed the coastal environment provisions in the relevant policy documents, in particular the Horowhenua District Plan and the Horizons One Plan. The assessment process undertaken by Frank Boffa in defining the landscape character of the coastal environment provided a more detailed definition of the areas of Outstanding Natural Landscape than that shown crudely (based on 1:50,000 scale mapping) on the HDC planning maps. HDC has accepted this more detailed assessment. The project team undertook a more fine-grained analysis of the coastal features, vegetation areas and hazard areas on the application site and surrounding area. This approach has provided a site-specific analysis of the coastal environment including those features of relevance listed in Policy 1 in the local area (areas where coastal processes, influences or qualities are significant; areas at risk from coastal hazards; coastal vegetation and

	e. coastal vegetation and the habitat of indigenous coastal species including migratory birds; f. elements and features that contribute to the natural character, landscape, visual qualities or amenity values; g. items of cultural and historic heritage in the coastal marine area or on the coast; h. inter-related coastal marine and terrestrial systems, including the intertidal zone; and i. physical resources and built facilities, including infrastructure, that have modified the coastal environment.	habitat; natural character, landscape, visual qualities or amenity values; items of cultural and historic heritage on the coast; and inter-related systems) from which development of the proposed activity could commence. This has placed the coastal environment of the application property at the forefront of the design and assessment process and has resulted in the features of significance being protected and enhanced by the proposed activities. This site-specific and targeted approach provides a tailored solution to the property which has considered the characteristics of the coastal environment in this locality and addressed the specific issues that arise in this area. I therefore consider the proposal is consistent with Policy 1 of the NZCPS.
Policy 2 The Treaty of Waitangi, tangata whenua and Māori	In taking account of the principles of the Treaty of Waitangi (Te Tiriti o Waitangi), and kaitiakitanga, in relation to the coastal environment: a. recognise that tangata whenua have traditional and continuing cultural relationships with areas of the coastal environment, including places where they have lived and fished for generations; b. involve iwi authorities or hapū on behalf of tangata whenua in the preparation of regional policy statements, and plans, by undertaking effective consultation with tangata whenua; with such consultation to be early, meaningful, and as far as practicable in accordance with tikanga Māori;	As part of the development process, the Applicant engaged with iwi, including Ngāti Kikopiri. The engagement with iwi and Ngāti Kikopiri, and the Cultural Values Assessment, conveyed to the Applicant by Ngāti Kikopiri, outlined an inter-related nature between some groups in the area. I understand that the Applicant intends to continue to consult with and discuss opportunities for iwi throughout the development of the proposed activities. The Memorandum of Understanding (MoU) between the Applicant and Ngāti Kikopiri provides for this ongoing engagement. The Applicant is keen to continue to involve tangata whenua in the development of the land and water in a way that identifies and provides for their values. The evidence of Phil Tataurangi further addresses this.

	c. with the consent of tangata whenua and as far as practicable in accordance with tikanga Māori, incorporate mātauranga Māori in regional policy statements, in plans, and in the consideration of applications for resource consents, notices of requirement for designation and private plan changes; d. provide opportunities in appropriate circumstances for Māori involvement in decision making, for example when a consent application or notice of requirement is dealing with cultural localities or issues of cultural significance, and Māori experts, including pūkenga, may have knowledge not otherwise available; e. take into account any relevant iwi resource management plan and any other relevant planning document recognised by the appropriate iwi authority or hapū and lodged with the council, to the extent that its content has a bearing on resource management issues in the region or district; and i. where appropriate incorporate references to, or material from, iwi resource management plans in regional policy statements and in plans; and ii. consider providing practical assistance to iwi or hapū who have indicated a wish to develop iwi resource management plans;	

	f. provide for opportunities for tangata whenua to exercise kaitiakitanga over waters, forests, lands, and fisheries in the coastal environment through such measures as: i. bringing cultural understanding to monitoring of natural resources; ii. providing appropriate methods for the management, maintenance and protection of the taonga of tangata whenua; iii. having regard to regulations, rules or bylaws relating to ensuring sustainability of fisheries resources such as taiāpure, mahinga mātaitai or other non commercial Māori customary fishing; g. in consultation and collaboration with tangata whenua, working as far as practicable in accordance with tikanga Māori, and recognising that tangata whenua have the right to choose not to identify places or values of historic, cultural or spiritual significance or special value: i. recognise the importance of Māori cultural and heritage values through such methods as historic heritage, landscape and cultural impact assessments; and ii. provide for the identification, assessment, protection and management of areas or sites of significance or special value to Māori, including by historic analysis and	

	archaeological survey and the development of methods such as alert layers and predictive methodologies for identifying areas of high potential for undiscovered Māori heritage, for example coastal pā or fishing villages.	
Policy 3 Precautionary approach	1. Adopt a precautionary approach towards proposed activities whose effects on the coastal environment are uncertain, unknown, or little understood, but potentially significantly adverse. 2. In particular, adopt a precautionary approach to use and management of coastal resources potentially vulnerable to effects from climate change, so that: a. avoidable social and economic loss and harm to communities does not occur; b. natural adjustments for coastal processes, natural defences, ecosystems, habitat and species are allowed to occur; and c. the natural character, public access, amenity and other values of the coastal environment meet the needs of future generations.	The precautionary approach to managing potential effects from the coastal location has been integral to the project design throughout development of the project. The coastline in this location is not particularly susceptible to coastal erosion and the potential effects of climate change have been taken into account and assessed as part of the project design. As detailed in the evidence of others, the proposed activities will not adversely affect the sensitive frontal dune area in which most serious wind erosion issues develop. In terms of coastal erosion, the *Coastal process and vegetation* report submitted with the application outlines how the shoreline in this area is moving seaward at a rate of at least 0.5-1m per year. Coastal erosion is therefore not considered to pose a risk to the application property. The report outlines estuarine erosion along the margins of the Ōhau River as follows: *Available data suggests that, over long periods of time, the rate of bank erosion averages about 1-2 m/yr. The erosion is probably episodic, with significant erosion possible during major flood events, with periods of much lesser erosion between such events. Any parts of the golf course (fairways, tees etc.) located close to the river margin may periodically need to be moved due to erosion. The areas likely to be at highest risk from erosion with existing channel geometry are identified.* The report considers in full the potential effect of climate change in combination with other contributing factors, including accretion along

		this stretch of the coast, to provide a comprehensive indication of the likely effects. No golf course infrastructure is proposed in the existing channel geometry or in a location considered to be particularly susceptible to estuarine erosion. I consider the proposed activities are sufficiently precautionary in their design to achieve the intent of Policy 3.
Policy 4 Integration	Provide for the integrated management of natural and physical resources in the coastal environment, and activities that affect the coastal environment. This requires: a. co-ordinated management or control of activities within the coastal environment, and which could cross administrative boundaries, particularly: i. the local authority boundary between the coastal marine area and land; ii. local authority boundaries within the coastal environment, both within the coastal marine area and on land; and iii. where hapū or iwi boundaries or rohe cross local authority boundaries; b. working collaboratively with other bodies and agencies with responsibilities and functions relevant to resource management, such as where land or waters are held or managed for conservation purposes; and c. particular consideration of situations where: i. subdivision, use, or development and its effects above or below the line of mean high water springs will	The Applicant has embraced an integrated management approach to the development, construction and management of the project. A co-ordinated approach has been employed through consultation with Horizons Regional Council, Horowhenua District Council, Ngāti Kikopiri and neighbouring properties. The Applicant engaged with these parties at an early stage in the process for a range of matters, including ecological site assessment, site walkovers and others. The resource consent application was prepared as a comprehensive document covering both regional and district matters in a single set of documents so that all matters relating to the proposed development can be considered in the round. No activity proposed will cross the line of mean high water springs. Public use and enjoyment of the coast will be enhanced through the provision of improved access to the coast. Coastal hazards are addressed elsewhere in evidence. Sedimentation of waterbodies will be avoided during construction activities through implementation of a comprehensive, approved erosion and sediment control plan. Cumulative effects are addressed elsewhere in evidence. I consider this approach to achieve the integrated approach to resource management sought by Policy 4.

	require, or is likely to result in, associated use or development that crosses the line of mean high water springs; or ii. public use and enjoyment of public space in the coastal environment is affected, or is likely to be affected; or iii. development or land management practices may be affected by physical changes to the coastal environment or potential inundation from coastal hazards, including as a result of climate change; or iv. land use activities affect, or are likely to affect, water quality in the coastal environment and marine ecosystems through increasing sedimentation; or v. significant adverse cumulative effects are occurring, or can be anticipated.	
Policy 6 Activities in the coastal environment	1. In relation to the coastal environment: a. recognise that the provision of infrastructure, the supply and transport of energy including the generation and transmission of electricity, and the extraction of minerals are activities important to the social, economic and cultural well-being of people and communities; b. consider the rate at which built development and the associated public infrastructure should be enabled to provide for the reasonably foreseeable	The landscape and visual impact assessment and the assessment of coastal geomorphology and ecology provided with the resource consent application documents, as well as the overall design for the golf course, consider the effects of the proposal on the coastal environment. Those assessments take into account the landscape and coastal features identified by the District Council and assessed on the ground by the Regional Council and the project team. The coastal environment assessment in the landscape and visual impact assessment states: *That in terms of Coastal Environment considerations, the proposed development –*

	needs of population growth without compromising the other values of the coastal environment; c. encourage the consolidation of existing coastal settlements and urban areas where this will contribute to the avoidance or mitigation of sprawling or sporadic patterns of settlement and urban growth; d. recognise tangata whenua needs for papakāinga, marae and associated developments and make appropriate provision for them; e. consider where and how built development on land should be controlled so that it does not compromise activities of national or regional importance that have a functional need to locate and operate in the coastal marine area; f. consider where development that maintains the character of the existing built environment should be encouraged, and where development resulting in a change in character would be acceptable; g. take into account the potential of renewable resources in the coastal environment, such as energy from wind, waves, currents and tides, to meet the reasonably foreseeable needs of future generations; h. consider how adverse visual impacts of development can be avoided in areas sensitive to such effects, such as headlands and prominent ridgelines, and as	• *Will preserve the natural character of the Coastal Environment.* • *Will increase and enhance the levels of natural character throughout the site.* • *Recognises and respects the sensitivities and dynamics of the coastal dune landscape.* • *Embraces opportunities to restore and rehabilitate the natural character of the site and its adjacent coastal edge.* It goes on: *The proposed Douglas Links Golf Course will –* *1. Have no adverse effects on the environment that cannot be readily mitigated, and will in fact enhance the landscape character, biodiversity habitat and the amenity values of the coastal landscape.* *2. Will restore and rehabilitate degraded and vulnerable landscapes and vegetation, particularly along the coastal margin.* *3. Will protect and enhance natural character values throughout the site.* There is a demonstrable functional need for the coastal location for the proposed activity given links golf courses are, by their nature, located on the marginal coastal land behind the foredunes. No development is proposed on headlands or prominent ridgelines. All development will be set back from the coastal marine area, in particular all built form will be significantly removed from the coastal edges of the property. Based on this assessment, together with the positive effects derived from the proposed revegetation of the coastal dunes, I consider the proposal is consistent with Policy 6 of the NZCPS.

	far as practicable and reasonable apply controls or conditions to avoid those effects; i. set back development from the coastal marine area and other water bodies, where practicable and reasonable, to protect the natural character, open space, public access and amenity values of the coastal environment; and j. where appropriate, buffer areas and sites of significant indigenous biological diversity, or historic heritage value. 2. Additionally, in relation to the coastal marine area: a. recognise potential contributions to the social, economic and cultural wellbeing of people and communities from use and development of the coastal marine area, including the potential for renewable marine energy to contribute to meeting the energy needs of future generations; b. recognise the need to maintain and enhance the public open space and recreation qualities and values of the coastal marine area; c. recognise that there are activities that have a functional need to be located in the coastal marine area, and provide for those activities in appropriate places;	

	d. recognise that activities that do not have a functional need for location in the coastal marine area generally should not be located there; and e. promote the efficient use of occupied space, including by: i. requiring that structures be made available for public or multiple use wherever reasonable and practicable; ii. requiring the removal of any abandoned or redundant structure that has no heritage, amenity or reuse value; and iii. considering whether consent conditions should be applied to ensure that space occupied for an activity is used for that purpose effectively and without unreasonable delay.	
Policy 11 Indigenous biological diversity (biodiversity)	To protect indigenous biological diversity in the coastal environment: a. avoid adverse effects of activities on: i. indigenous taxa that are listed as threatened or at risk in the New Zealand Threat Classification System lists; ii. taxa that are listed by the International Union for Conservation of Nature and Natural Resources as threatened;	The evidence of Vaughan Keesing addresses in full the effects of the proposed activities on indigenous biological diversity and in particular Indigenous vegetation communities and habitats have been extensively mapped by Boffa Miskell ecologists and the findings summarised in Dr Keesing's evidence. Dr Keesing quantifies and assesses the potential effects on all identified threatened, rare, at risk, nationally significant ecosystems, vegetation types and habitats. He also assesses the potential effects on indigenous coastal vegetation and habitats and on ecosystems that are of value for other reasons, as listed in (b).

	iii. indigenous ecosystems and vegetation types that are threatened in the coastal environment, or are naturally rare; iv. habitats of indigenous species where the species are at the limit of their natural range, or are naturally rare; v. areas containing nationally significant examples of indigenous community types; and vi. areas set aside for full or partial protection of indigenous biological diversity under other legislation; and b. avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on: i. areas of predominantly indigenous vegetation in the coastal environment; ii. habitats in the coastal environment that are important during the vulnerable life stages of indigenous species; iii. indigenous ecosystems and habitats that are only found in the coastal environment and are particularly vulnerable to modification, including estuaries, lagoons, coastal wetlands, dunelands, intertidal zones, rocky reef systems, eelgrass and saltmarsh; iv. habitats of indigenous species in the coastal environment that are important for recreational, commercial, traditional or cultural purposes;	Dr Keesing's evidence confirms that adverse effects on those matters listed in (a) are avoided and that significant effects on matters listed in (b) are also avoided. The proposal has been identified by Dr Keesing as generating some positive impacts on indigenous biological diversity in the coastal environment through the comprehensive revegetation programme and the protection (and augmentation) of existing areas of native vegetation, including the isolated kanuka remnants on the property. Based on this I consider the proposal to be consistent with Policy 11.

	v. habitats, including areas and routes, important to migratory species; and vi. ecological corridors, and areas important for linking or maintaining biological values identified under this policy.	
Policy 13 Preservation of natural character	1. To preserve the natural character of the coastal environment and to protect it from inappropriate subdivision, use, and development: a. avoid adverse effects of activities on natural character in areas of the coastal environment with outstanding natural character; and b. avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on natural character in all other areas of the coastal environment; including by: c. assessing the natural character of the coastal environment of the region or district, by mapping or otherwise identifying at least areas of high natural character; and d. ensuring that regional policy statements, and plans, identify areas where preserving natural character requires objectives, policies and rules, and include those provisions. 2. Recognise that natural character is not the same as natural features and landscapes or amenity values and may include matters such as:	I am reliant on the expertise of Frank Boffa and Jim Dahm in relation to the preservation and, where appropriate restoration, of the natural character of the coastal environment and the protection of natural features and landscape values. The iterative course design process included changes requested by Frank Boffa to better provide for natural character and coastal landscape values. These changes have resulted in a design and layout that sensitively addresses the coastal environment. The coastal landscape on the property and on surrounding land has been heavily modified through productive land uses, including forestry and farming. The application documents included a Landscape Assessment prepared by Frank Boffa which states that: *The reviewed assessment confirms that in line with the District Plan assessment, there are no areas of outstanding natural character within the Douglas Links site. The District Plan also indicates there are no areas of outstanding natural character along the Horowhenua Coast. The review confirms that while there are areas of very high natural character within the Douglas Links site, there are no areas of outstanding natural character within the site. The areas identified in this assessment as having very high natural character include the active coastal foredune and the salt marsh wetland on the Ohau River.* Schedule G to the One Plan identifies "*Parts of the Coastline of the Region*" as outstanding Natural Features or Landscapes, although the

	a. natural elements, processes and patterns; b. biophysical, ecological, geological and geomorphological aspects; c. natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks; d. the natural movement of water and sediment; e. the natural darkness of the night sky; f. places or areas that are wild or scenic; g. a range of natural character from pristine to modified; and h. experiential attributes, including the sounds and smell of the sea; and their context or setting.	subject area is not listed specifically. The identified characteristics/values are: *i. Visual and scenic characteristics, particularly its special coastal landscape features* *ii. Coastal geological processes* *iii. Ecological value, particularly the Whanganui, Whangaehu, Turakina, Rangitikei, Akitio, Ohau, Waikawa and Manawatu River estuaries as habitats for indigenous fauna* *iv. Recreational value* *v. Significance to tangata whenua* *vi. Scientific and educational values* *vii. Historic heritage, in particular historical importance, archaeological sites and high potential for archaeological site discovery.* These matters are addressed throughout my evidence and the evidence of others. The assessment process undertaken by Frank Boffa in defining the landscape character of the coastal environment provided a more detailed definition of the areas of Outstanding Natural Landscape than that shown crudely (based on 1:50,000 scale mapping) on the HDC planning maps. HDC has accepted this more detailed assessment. The policy framework seeks to avoid adverse effects on outstanding natural features and landscapes and avoid significant effects on other natural features and landscapes (NZCPS Policy 15).
Policy 14 Restoration of natural character	Promote restoration or rehabilitation of the natural character of the coastal environment, including by: a. identifying areas and opportunities for restoration or rehabilitation; b. providing policies, rules and other methods directed at restoration or rehabilitation in regional policy statements, and plans; c. where practicable, imposing or reviewing restoration or rehabilitation conditions on resource consents and designations, including for the continuation of activities; and recognising that where degraded areas of the	

	coastal environment require restoration or rehabilitation, possible approaches include: i. restoring indigenous habitats and ecosystems, using local genetic stock where practicable; or ii. encouraging natural regeneration of indigenous species, recognising the need for effective weed and animal pest management; or iii. creating or enhancing habitat for indigenous species; or iv. rehabilitating dunes and other natural coastal features or processes, including saline wetlands and intertidal saltmarsh; or v. restoring and protecting riparian and intertidal margins; or vi. reducing or eliminating discharges of contaminants; or vii. removing redundant structures and materials that have been assessed to have minimal heritage or amenity values and when the removal is authorised by required permits, including an archaeological authority under the Historic Places Act 1993; or viii. restoring cultural landscape features; or ix. redesign of structures that interfere with ecosystem processes; or	With reference specifically to the proposed works in the area of Esplanade Reserve on the western edge of the property, the Landscape Assessment states: *While three golf holes are in part sited within the adjacent Esplanade Reserve (holes 4, 16 and 17), this area is largely within the exotic treed area with very little undergrowth and/or biodiversity values. The intention is to replace the exotic trees and, as appropriate, carry out minor reshaping earthworks followed by revegetation as outlined in Mr Dahm's report in conjunction with the golf course grassland management proposed. The refined and combined high natural character area and the Coastal ONFL area which includes the stable dunes and the active foredune, also incorporates additional golf holes, namely holes 4, 12, part of 13, 15, and in part 3 and 11. The coastal dune restoration and rehabilitation measures proposed by Mr Dahm will extend as appropriate into these areas.* The landscape assessment report concludes that: *… in terms of Coastal Environment considerations, the proposed development –* a) *Will preserve the natural character of the Coastal Environment.* b) *Will increase and enhance the levels of natural character throughout the site.* c) *Recognises and respects the sensitivities and dynamics of the coastal dune landscape.* d) *Embraces opportunities to restore and rehabilitate the natural character of the site and its adjacent coastal edge.* *That in terms of visual effects considerations, the proposed development –*

	x. decommissioning or restoring historic landfill and other contaminated sites which are, or have the potential to, leach material into the coastal marine area.	a) *Will not create adverse visual or amenity effects from locations within or beyond the site.* b) *Will enhance the visual amenity of the landscape in the context of its coastal setting.*
Policy 15 Natural features and natural landscapes	To protect the natural features and natural landscapes (including seascapes) of the coastal environment from inappropriate subdivision, use, and development: a. avoid adverse effects of activities on outstanding natural features and outstanding natural landscapes in the coastal environment; and b. avoid significant adverse effects and avoid, remedy, or mitigate other adverse effects of activities on other natural features and natural landscapes in the coastal environment; including by: c. identifying and assessing the natural features and natural landscapes of the coastal environment of the region or district, at minimum by land typing, soil characterisation and landscape characterisation and having regard to: i. natural science factors, including geological, topographical, ecological and dynamic components; ii. the presence of water including in seas, lakes, rivers and streams; iii. legibility or expressiveness – how obviously the feature or landscape demonstrates its formative processes;	And that: *The proposed Douglas Links Golf Course will –* *1. Have no adverse effects on the environment that cannot be readily mitigated, and will in fact enhance the landscape character, biodiversity habitat and the amenity values of the coastal landscape.* *2. Will restore and rehabilitate degraded and vulnerable landscapes and vegetation, particularly along the coastal margin.* *3. Will protect and enhance natural character values throughout the site.* Restoration and rehabilitation of the coastal environment will be provided for through the removal of exotic, invasive and weed species from the coastal dunes and replacement with more appropriate native species using a species list developed by the project team and as detailed in the restoration plan provided with evidence. Existing areas of native vegetation will be protected and augmented with additional plantings. As detailed in the assessment undertaken by Frank Boffa, adverse effects on outstanding natural features and landscapes and significant effects on other natural features and landscapes will be avoided by the final course design. The assessment of effects and assessment against NZCPS and regional and district plan policy sets out how the proposal has been designed and has incorporated mitigation measures preserve the natural

	iv. aesthetic values including memorability and naturalness; v. vegetation (native and exotic); vi. transient values, including presence of wildlife or other values at certain times of the day or year; vii. whether the values are shared and recognised; viii. cultural and spiritual values for tangata whenua, identified by working, as far as practicable, in accordance with tikanga Māori; including their expression as cultural landscapes and features; ix. historical and heritage associations; and x. wild or scenic values; d. ensuring that regional policy statements, and plans, map or otherwise identify areas where the protection of natural features and natural landscapes requires objectives, policies and rules; and e. including the objectives, policies and rules required by (d) in plans.	character of the coastal environment and protect natural features and landscape values. Based on this assessment and the evidence of Frank Boffa and Jim Dahm, I am comfortable that the proposed activities will result in the preservation and, where appropriate restoration, of the natural character of the coastal environment and the protection of natural features and landscape values and that the proposal is therefore consistent with Policies 13, 14 and 15 of the NZCPS.
Policy 17 Historic heritage identification	Protect historic heritage in the coastal environment from inappropriate subdivision, use, and development by:	Measures have been taken, including the protection of identified sites of historic value and the preparation of an archaeological authority application, to ensure historic heritage is protected during and after the proposed development. The Applicant is working with Ngāti Kikopiri

and protection	a. identification, assessment and recording of historic heritage, including archaeological sites; b. providing for the integrated management of such sites in collaboration with relevant councils, heritage agencies, iwi authorities and kaitiaki; c. initiating assessment and management of historic heritage in the context of historic landscapes; d. recognising that heritage to be protected may need conservation; e. facilitating and integrating management of historic heritage that spans the line of mean high water springs; f. including policies, rules and other methods relating to (a) to (e) above in regional policy statements, and plans; g. imposing or reviewing conditions on resource consents and designations, including for the continuation of activities; h. requiring, where practicable, conservation conditions; and i. considering provision for methods that would enhance owners' opportunities for conservation of listed heritage structures, such as relief grants or rates relief.	regarding appropriate methods to recognise and interpret features of historic heritage value. I consider the proposal is consistent with Policy 17.
Policy 18	Recognise the need for public open space within and adjacent to the coastal marine area, for public use and	

Public open space	appreciation including active and passive recreation, and provide for such public open space, including by: a. ensuring that the location and treatment of public open space is compatible with the natural character, natural features and landscapes, and amenity values of the coastal environment; b. taking account of future need for public open space within and adjacent to the coastal marine area, including in and close to cities, towns and other settlements; c. maintaining and enhancing walking access linkages between public open space areas in the coastal environment; d. considering the likely impact of coastal processes and climate change so as not to compromise the ability of future generations to have access to public open space; and e. recognising the important role that esplanade reserves and strips can have in contributing to meeting public open space needs.	Other than the beach itself, there is no public open space at the coast or coastal marine area in this location. Access to this stretch of Horowhenua coast in this area currently is currently limited to public access points at Hokio Beach and Waikawa Beach. Hokio Beach, over 6km to the north of the subject property, is the nearest public access point to the beach in this area. Public access and open space in the coastal environment will be improved as a result of the proposed activities through the provision of an improved pedestrian walkway from Muhunoa West Road to the coast. This public access has been secured through the district council consents but will only be achieved through the granting of the full suite of consents required to give effect to the proposal. As such, the regional consents are critical to the achievement of improved public access to the coast. Recreation opportunities along the coast will be enhanced by the provision of this improved public access. The creation of a golf course, while not public, will improve opportunities for access the coast through playing a round of golf amongst the dunes. No access is currently available while the land is farmed and no access would be allowed in the case of the majority of potential uses for the application site. The proposal will not enable any vehicular access on the beach, foreshore or seabed. The public access proposed is pedestrian only.
Policy 19 Walking access	1. Recognise the public expectation of and need for walking access to and along the coast that is practical, free of charge and safe for pedestrian use. 2. Maintain and enhance public walking access to, along and adjacent to the coastal marine area, including by: a. identifying how information on where the public have walking access will be made publicly available;	Some vehicular access will be required to the esplanade reserve during construction for vegetation clearance and earthworks in the stable dunes. This vehicle access will be temporary and controlled and all land will be reinstated on completion. As such, any effect will be transient and will not cause harm to the dune or ecological system, or any other protected value of the coast. The temporary vehicular access will not affect any existing activities.

	b. avoiding, remedying or mitigating any loss of public walking access resulting from subdivision, use, or development; and c. identifying opportunities to enhance or restore public walking access, for example where: i. connections between existing public areas can be provided; or ii. improving access would promote outdoor recreation; or iii. physical access for people with disabilities is desirable; or iv. the long-term availability of public access is threatened by erosion or sea level rise; or v. access to areas or sites of historic or cultural significance is important; or vi. subdivision, use, or development of land adjacent to the coastal marine area has reduced public access, or has the potential to do so. 3. Only impose a restriction on public walking access to, along or adjacent to the coastal marine area where such a restriction is necessary: a. to protect threatened indigenous species; or b. to protect dunes, estuaries and other sensitive natural areas or habitats; or	With the potential improvement of public access to the beach and the potential for more (though limited) access across the property itself, I consider the proposed activities to be consistent with Policies 18, 19 and 20 of the NZCPS.

	c. to protect sites and activities of cultural value to Māori; or d. to protect historic heritage; or e. to protect public health or safety; or f. to avoid or reduce conflict between public uses of the coastal marine area and its margins; or g. for temporary activities or special events; or h. for defence purposes in accordance with the Defence Act 1990; or i. to ensure a level of security consistent with the purpose of a resource consent; or j. in other exceptional circumstances sufficient to justify the restriction. 4. Before imposing any restriction under (3), consider and where practicable provide for alternative routes that are available to the public free of charge at all times.	
Policy 20 Vehicle access	1. Control use of vehicles, apart from emergency vehicles, on beaches, foreshore, seabed and adjacent public land where: a. damage to dune or other geological systems and processes; or b. harm to ecological systems or to indigenous flora and fauna, for example marine mammal and bird habitats or breeding areas and shellfish beds; or	

	c. danger to other beach users; or d. disturbance of the peaceful enjoyment of the beach environment; or e. damage to historic heritage; or f. damage to the habitats of fisheries resources of significance to customary, commercial or recreational users; or g. damage to sites of significance to tangata whenua; might result. 2. Identify the locations where vehicular access is required for boat launching, or as the only practicable means of access to private property or public facilities, or for the operation of existing commercial activities, and make appropriate provision for such access. 3. Identify any areas where and times when recreational vehicular use on beaches, foreshore and seabed may be permitted, with or without restriction as to type of vehicle, without a likelihood of any of (1)(a) to (g) occurring.	
Policy 22 Sedimentation	1. Assess and monitor sedimentation levels and impacts on the coastal environment. 2. Require that subdivision, use, or development will not result in a significant increase in sedimentation in the coastal marine area, or other coastal water.	The proposed activities will not result in significant increase in sedimentation of the coastal marine area or coastal water. During construction, earthworks will be managed in accordance with an approved erosion and sediment control plan to ensure sand and other sediment is not discharged to coastal waters. This can be secured and managed by conditions of consent and the employment of best practices erosion and sediment controls.

	3. Control the impacts of vegetation removal on sedimentation including the impacts of harvesting plantation forestry. 4. Reduce sediment loadings in runoff and in stormwater systems through controls on land use activities.	Any vegetation clearance will also be managed to avoid discharge of exposed sand and soil and will be re-established with revegetation as soon as practical. I am advised by the course construction manager that progressive stabilisation of the works will be employed to 'lock down' the desired landforms immediately on completion of the recontouring. This approach is primarily used to secure the landform sought for the golf course but will also ensure the sandy soils are not lost to windblown erosion. No more than approximately 2 hectares of the property will be open at any one time. I consider the proposal to be consistent with Policy 22.
Policy 23 Discharge of contaminants	1. In managing discharges to water in the coastal environment, have particular regard to: a. the sensitivity of the receiving environment; b. the nature of the contaminants to be discharged, the particular concentration of contaminants needed to achieve the required water quality in the receiving environment, and the risks if that concentration of contaminants is exceeded; and c. the capacity of the receiving environment to assimilate the contaminants; and: d. avoid significant adverse effects on ecosystems and habitats after reasonable mixing; e. use the smallest mixing zone necessary to achieve the required water quality in the receiving environment; and	There is potential for discharges from the earthworks during construction and from treated wastewater during operation of the golf course. In both these instances, the works will be managed to avoid any discharges to water in the coastal environment. The proposed earthworks will be managed in accordance with appropriate erosion and sediment controls to ensure discharge to coastal water does not occur. This can be secured and managed by conditions of consent and the employment of best practices erosion and sediment controls. The wastewater treatment and discharge proposed will occur in a location away from the coastal edge of the property and irrigation rates will be such that the surrounding land will be capable of containing the discharge of treated wastewater. This is demonstrated in the engineering report submitted with the resource consent application documents. I therefore consider the proposal is consistent with Policy 23.

	f. minimise adverse effects on the life-supporting capacity of water within a mixing zone. 2. In managing discharge of human sewage, do not allow: a. discharge of human sewage directly to water in the coastal environment without treatment; and b. the discharge of treated human sewage to water in the coastal environment, unless: i. there has been adequate consideration of alternative methods, sites and routes for undertaking the discharge; and ii. informed by an understanding of tangata whenua values and the effects on them. 3. Objectives, policies and rules in plans which provide for the discharge of treated human sewage into waters of the coastal environment must have been subject to early and meaningful consultation with tangata whenua. 4. In managing discharges of stormwater take steps to avoid adverse effects of stormwater discharge to water in the coastal environment, on a catchment by catchment basis, by: a. avoiding where practicable and otherwise remedying cross contamination of sewage and stormwater systems;	

	b. reducing contaminant and sediment loadings in stormwater at source, through contaminant treatment and by controls on land use activities; c. promoting integrated management of catchments and stormwater networks; and d. promoting design options that reduce flows to stormwater reticulation systems at source. 5. In managing discharges from ports and other marine facilities: a. require operators of ports and other marine facilities to take all practicable steps to avoid contamination of coastal waters, substrate, ecosystems and habitats that is more than minor; b. require that the disturbance or relocation of contaminated seabed material, other than by the movement of vessels, and the dumping or storage of dredged material does not result in significant adverse effects on water quality or the seabed, substrate, ecosystems or habitats; c. require operators of ports, marinas and other relevant marine facilities to provide for the collection of sewage and waste from vessels, and for residues from vessel maintenance to be safely contained and disposed of; and	

	d. consider the need for facilities for the collection of sewage and other wastes for recreational and commercial boating.	
Policy 24 Identification of coastal hazards	1. Identify areas in the coastal environment that are potentially affected by coastal hazards (including tsunami), giving priority to the identification of areas at high risk of being affected. Hazard risks, over at least 100 years, are to be assessed having regard to: a. physical drivers and processes that cause coastal change including sea level rise; b. short-term and long-term natural dynamic fluctuations of erosion and accretion; c. geomorphological character; d. the potential for inundation of the coastal environment, taking into account potential sources, inundation pathways and overland extent; e. cumulative effects of sea level rise, storm surge and wave height under storm conditions; f. influences that humans have had or are having on the coast; g. the extent and permanence of built development; and h. the effects of climate change on: i. matters (a) to (g) above;	Small parts of the site along the Ōhau River have been identified as being susceptible to flooding. No significant activity will occur in this area. No sensitive activities (such as accommodation units) have been placed in areas of high risk from natural hazard events. As detailed in the evidence of others, the proposed activities will not adversely affect the sensitive frontal dune area in which most serious wind erosion issues develop. In terms of coastal erosion, the *Coastal process and vegetation* report submitted with the application outlines how the shoreline in this area is moving seaward at a rate of at least 0.5-1m per year. Coastal erosion is therefore not considered to pose a risk to the application property. The report outlines estuarine erosion along the margins of the Ōhau River as follows: *Available data suggests that, over long periods of time, the rate of bank erosion averages about 1-2 m/yr. The erosion is probably episodic, with significant erosion possible during major flood events, with periods of much lesser erosion between such events. Any parts of the golf course (fairways, tees etc.) located close to the river margin may periodically need to be moved due to erosion. The areas likely to be at highest risk from erosion with existing channel geometry are identified.* No golf course infrastructure is proposed in the existing channel geometry or in a location considered to be particularly susceptible to estuarine erosion. The only activities in close proximity to identified hazard areas are golf holes which can be easily relocated away from hazard areas should the

	ii. storm frequency, intensity and surges; and iii. coastal sediment dynamics; taking into account national guidance and the best available information on the likely effects of climate change on the region or district.	management level for coastal hazard require movement from these areas. The flood management capabilities of the river plain, including the identified saltmarsh wetland on the northern side of the Ōhau River, will be maintained and protected during and after the proposed development of the golf course. There will be no critical infrastructure near any area identified as being at risk from coastal hazards. I consider the proposal to be consistent with Policies 24 and 25.
Policy 25 Subdivision, use, and development in areas of coastal hazard risk	In areas potentially affected by coastal hazards over at least the next 100 years: a. avoid increasing the risk of social, environmental and economic harm from coastal hazards; b. avoid redevelopment, or change in land use, that would increase the risk of adverse effects from coastal hazards; c. encourage redevelopment, or change in land use, where that would reduce the risk of adverse effects from coastal hazards, including managed retreat by relocation or removal of existing structures or their abandonment in extreme circumstances, and designing for relocatability or recoverability from hazard events; d. encourage the location of infrastructure away from areas of hazard risk where practicable; e. discourage hard protection structures and promote the use of alternatives to them, including natural defences; and f. consider the potential effects of tsunami and how to avoid or mitigate them.	

Policy 26 Natural defences against coastal hazards	1. Provide where appropriate for the protection, restoration or enhancement of natural defences that protect coastal land uses, or sites of significant biodiversity, cultural or historic heritage or geological value, from coastal hazards. 2. Recognise that such natural defences include beaches, estuaries, wetlands, intertidal areas, coastal vegetation, dunes and barrier islands.	Existing natural defences against coastal hazards (including beaches, wetlands and dunes) in the coastal area will be retained and protected during and after construction of the proposed development. Additional revegetation of the dunes with appropriate native vegetation species will ensure the dunes are stabilised in the longer term and will continue to provide natural defence to the coastal environment against coastal hazards. I consider the proposal to be consistent with Policy 26.

National Policy Statement for Freshwater Management 2020		
Reference	**Text**	**Comment**
Objective	The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises: a. first, the health and well-being of water bodies and freshwater ecosystems b. second, the health needs of people (such as drinking water) *c.* third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.	The policy considerations below and against the policies of the One Plan provide an assessment of the impacts of the proposed activities on the health and well-being of water bodies and freshwater ecosystems. The evidence of Vaughan Keesing also addresses this matter. The health needs of people will not be adversely affected by the proposed activities. Potable water supply to the proposed ancillary buildings can be providence without affecting existing water supplies. The ecosystem and habitat value of the Ōhau River will be protected through, amongst other things: a) the avoidance of discharges to the river and to land where it could reach the river; b) the confirmation (see the evidence of Alexandra Johansen) that the proposed irrigation water take will not affect surface water bodies or their flows; and c) the removal of the land from other possible productive land uses (including plantation forestry and farming) which have the potential to affect the quality of water bodies to a greater extent than the proposed activities. Consequently the river's values as a gathering area for mahinga kai, will not be affected. I therefore consider the health needs of people will be provide for by the proposed activities.

		The ability of people to provide for their social, economic, and cultural well-being as discussed later in my evidence and in the evidence of others. The proposed activities will not hinder this ability. I consider the proposed activities to be consistent with the objective of the NPS-FM.
Policy 1	Freshwater is managed in a way that gives effect to Te Mana o te Wai.	Te Mana o te Wai refers to the importance of water for the health and well-being of our environment and our communities. The proposed development has been designed and assessed in full consideration of the importance of water, as detailed in the reports accompanying the resource consent application, in particular the Boffa Miskell Ecological Survey report and the Bay Geological Services Limited Well Aquifer report, as well as the further information provided post-lodgement.
Policy 2	Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for.	As part of the development process, the Applicant engaged with Ngāti Kikopiri. The engagement with Ngāti Kikopiri, and the Cultural Values Assessment, conveyed to the Applicant by Ngāti Kikopiri, outlined that there is an inter-related nature between a number of groups in the area. It is my understanding that the Applicant intends to continue to consult with, and discuss opportunities for, iwi throughout the development of the proposed activities. The Memorandum of Understanding (MoU) between the Applicant and Ngāti Kikopiri provides for this ongoing engagement. The Applicant is keen to continue to involve tangata whenua in the development of the land and water in a way that identifies and provides for their values. The evidence of Phil Tataurangi further addresses this.
Policy 3	Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.	The Applicant has taken a whole of catchment approach when considering the effects of the proposed groundwater take and the potential for discharges to surface water (or where discharges could enter water). The evidence of Alexandra Johansen confirms that from a water quantity perspective, the proposed groundwater take will not result in allocation or recharge issues, nor will saltwater intrusion result from the proposed take. Construction approaches and on-going good management will ensure discharges resulting in uncontrolled adverse effects will be avoided.

Policy 6	There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.	In the further information provided to Horizons on 14 September 2021, Brendan Allen, the Head of Construction for the proposed golf course, states: *I believe the possibility of natural wetland drainage as a result of the golf course to be almost nonexistent.* *The native sandy soils on the site are very well suited to producing high quality firm and bouncy Fescue playing surfaces, and a key reason Grenadier Ltd is attracted to the site. Links golf courses are meant to be firm and dry. Sandy soils provide the free draining characteristics ideal for the construction of golf courses. Indeed, sand is frequently imported into golf courses to build greens and tees on and to be used as a topdressing medium to firm up surfaces. Grenadier will want to maintain wetland features to enhance the appeal of the wider golf landscape. Unlike the farms in the surrounding area there is no advantage to capturing moisture retentive soils to create 'productive' land.* *There will be no topsoil imported to site. Grenadier will be exclusively using the existing sands from the site and from the immediate surrounds of each specific zone. There should be no noticeable or measurable change in moisture retention. There are no upsides to Grenadier moving more moisture retentive soils into the areas meant for golf turf. Again, moisture retaining soils mean softer surfaces which lead to poorer playing conditions, extra growth to mow, and invasion of weed species grasses such as Poa Annua. Lower moisture soils encourage deeper root systems which can access natural rainfall and nutrients at depth better and leads to healthier grass requiring less fungicide and fertiliser.* *Grenadier will not be contouring to lead water away from the wetland.* *Additionally, the water level in the wetland is likely determined more by the level of the water table rather than runoff or seepage from surrounding soils.* *To meet the summer survival and health requirements of the Fescue turfgrass, Grenadier would potentially apply approximately 300mm of irrigation in the summer months when natural rainfall isn't frequent. I suspect that irrigation in the absence of rainfall would be more likely to enhance any wetland than detract from it, although the effect would be small enough to not be able to be measurable.* In the same further information request response, Boffa Miskell ecologists state:

		…the raupo wetland pocket is best described as a swamp (Johnson and Gerbeaux 20041) and the vegetation components (mostly raupo) are very able to manage high nutrient loading (e.g. Pegman & Ogden 20052, Vymazal 20113) Raupo has high decomposition rates (3kg/m2/year) and high biomass production rates enabling it to utilise high nutrient loading. *We understand that fairway management should not cause additional nutrient leachate. However, we note also that current farm practices in relation to nutrient addition will cease and the inputs related to the raupo wetland may actually balance. We also understand Mr Allan on behalf of Grenadier will be addressing this potential issue.* *In respect to the salt marsh wetland, this feature is some distance from any fairway or green (a very small back green of one hole is near) and therefore there will be a substantive non-fertilised area between it and those activities; and in a predominantly sand substrate soils leachate of that distance is highly unlikely. Again, the Applicant is proposing rehabilitation planting at the buffer of this area to remove the past exotic forestry influence and the current agricultural use of the land. From an ecological perspective this is considered a positive resulting from the proposal on the salt marsh. We note the northern margin of the salt marsh has emerging gorse, pampus and rank exotic grass invading the area.* Based on the above, it is my view that the design of the golf course, including iterative design process and the construction and operation procedures designed to protect the natural wetlands on the property, is consistent with Policy 6.
Policy 7	The loss of river extent and values is avoided to the extent practicable.	No river extent will be lost. River values will be protected through earthworks management and avoidance of discharges to the Ōhau River that might adversely affect those values. The proposed activities have been demonstrated to be consistent with Policy 7.
Policy 8	The significant values of outstanding water bodies are protected.	Outstanding water bodies are those "*identified in a regional policy statement, a regional plan, or a water conservation order as having one or more outstanding values*". Schedule B to the Horizons One Plan does not identify the Ōhau River as having one or more outstanding values. As such, I do not consider Policy 8 of the NPS-FM to apply under the current planning framework.

Policy 9	The habitats of indigenous freshwater species are protected.	For reasons described elsewhere in my evidence and the evidence of others, I do not consider the proposed activities will adversely affect water quality of the habitat values of existing water bodies on the site and in the surrounding area. I therefore consider the habitats of indigenous freshwater species will be protected in accordance with Policy 9.
Policy 10	The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.	The lower Ōhau River is identified in Schedule B to the One Plan as an "*Other Trout Fishery*". I am not aware of any reason to consider the proposed activities will affect the habitat of trout or salmon.
Policy 11	Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided.	No over allocation of freshwater will result from the proposed activities. Although I understand surface water in the catchment is fully allocated, the pump test data and the assessment undertaken by Alexandra Johansen of Bay Geological Services Limited indicated that the proposed groundwater take is not hydrologically linked to surface water bodies and will have no effect on water quantity in surface bodies. I understand there is not allocation issue with groundwater supply in the subject aquifer and recharge rates demonstrated from the pump test data were acceptable. I therefore consider the proposal to be consistent with Policy 11.
Policy 15	Communities are enabled to provide for their social, economic, and cultural well-being in a way that is consistent with this National Policy Statement.	The proposed activity has been demonstrated to be consistent with the NPS-FM and will enable the use of the property in a way that provides for the social, economic and cultural well-being of the local and wider communities.

Horizons One Plan		
Chapter 2: Te Ao Māori		
Reference	**Text**	**Comments**
Objective 2-1 Resource management	a. To have regard to the mauri of natural and physical resources to enable hapū and iwi to provide for their social, economic and cultural wellbeing. b. Kaitiakitanga must be given particular regard and the relationship of hapū and iwi with their ancestral lands, water,	I understand the Applicant will continue to endeavour to establish a relationship with iwi and hapū and to ensure the relationship they have with their ancestral lands and resources is recognised and protected. The evidence of Phil Tataurangi further addresses this.

	sites, wāhi tapu and other taonga (including wāhi tūpuna) must be recognised and provided for through resource management processes.	
Policy 2-1 Hapū and iwi involvement in resource management	The Regional Council must enable and foster kaitiakitanga and the relationship between hapū and iwi and their ancestral lands, water, sites, wāhi tapu and other taonga (including wāhi tūpuna) through increased involvement of hapū and iwi in resource management processes including: a. memoranda of partnership between the Regional Council and hapū or iwi which set clear relationship and communication parameters to address resource management objectives, b. recognition of existing arrangements and agreements between resource users, local authorities and hapū or iwi, c. development of catchment-based forums, involving the Regional Council, hapū, iwi, and other interested groups including resource users, for information sharing, planning and research, d. development, where appropriate, of hapū and iwi cultural indicator monitoring programmes by the Regional Council, e. assistance from the Regional Council to hapū or iwi to facilitate research, projects, seminars and training, f. development of joint management agreements between the Regional Council and hapū or iwi where appropriate, g. the Regional Council having regard to iwi management plans lodged with Council, h. involvement of hapū or iwi in resource consent decision-making and planning processes in the ways agreed in the memoranda of partnership and joint management agreements developed under (a) and (f) above, and	I understand the Applicant is keen to involve hapū and iwi in the on-going development decisions, including those made during the resource management process in recognition of the role hapū and iwi play in the management of land and resources.

	i. the Regional Council advising and encouraging resource consent applicants to consult directly with hapū or iwi where it is necessary to identify: i. the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga (including wāhi tūpuna), and ii. the actual and potential adverse effects of proposed activities on those relationships.	
Policy 2-2 Wāhi tapu, wāhi tūpuna and other sites of significance	a. Wāhi tapu, wāhi tūpuna and other sites of significance to Māori identified: … must be protected from inappropriate subdivision, use or development that would cause adverse effects on the qualities and features which contribute to the values of these sites. b. The Regional Council must facilitate hapū and iwi recording the locations of wāhi tapu, wāhi tūpuna and other sites of significance to Māori in an appropriate publicly-available database. c. Potential damage or disturbance (including that caused by inappropriate subdivision, use or development) to wāhi tapu, wāhi tūpuna and other sites of significance to Māori not identified (for confidentiality and sensitivity reasons) by hapū or iwi under (a), above, must be minimised by the Regional Council facilitating the compilation of databases by hapū and iwi to record locations which need to remain confidential. d. The Regional Council must ensure that resource users and contractors have clear procedures in the event wāhi tapu or wāhi tūpuna are discovered.	Policy 2-2(a) focuses on the protection of sites "from inappropriate subdivision, use or development that would cause adverse effects on the qualities and features which contribute to the values of these sites". Policy 2.4 is of key relevance to Table 2.1. Policy 2.4 requires that the specific resource management issues listed are "addressed in the manner set out in Table 2.1". With respect to clauses (l) and (n) referred to in the Section 42A report, Table 2.1 requires that these are addressed through the provisions of Chapters 4, 6, 13 and 14 of the One Plan. These matters are addressed elsewhere in my evidence and in the evidence of others. I have concluded the proposed activities to be consistent with the provisions of these chapters. It is my understanding that, with the provision of the restoration plan proposed and the additional lizard monitoring presented in the evidence of Dr Keesing, the areas of disagreement between Horizons' and the Applicant's experts in relation to Chapters 6 and 13 have been resolved. I therefore consider the proposed activities to be in accordance with the approach sought in Table 2.1 and consistent with Policy 2.4.
Policy 2-4 Other resource	The specific issues listed in 2.2 which were raised by *hapū* and *iwi* must be addressed in the manner set out in Table 2.1 below.	

management issues		
Chapter 4: Land		
Reference	**Text**	**Comment**
Objective 4-2 Regulating potential causes of accelerated erosion	Land is used in a manner that ensures: a. accelerated erosion and increased sedimentation in water bodies (with resultant adverse effects on people, buildings and infrastructure) caused by vegetation clearance, land disturbance, forestry, or cultivation are avoided as far as reasonably practicable, or otherwise remedied or mitigated, and b. sediment loads entering water bodies as a result of accelerated erosion are reduced to the extent required to be consistent with the water management objectives and policies for water quality set out in Chapter 5 of this Plan.	The proposed activities will not result in significant increase in sedimentation of the coastal marine area or coastal water. During construction, earthworks will be managed in accordance with an approved erosion and sediment control plan to ensure sand and other sediment is not discharged to coastal waters. This can be secured and managed by conditions of consent and the employment of best practices erosion and sediment controls. Any vegetation clearance will also be managed to avoid discharge of exposed sand and soil and will be re-established with revegetation as soon as practical. I am advised by the course construction manager that progressive stabilisation of the works will be employed to 'lock down' the desired landforms immediately on completion of the recontouring. This approach is primarily used to secure the landform sought for the golf course but will also ensure the sandy soils are not lost to windblown erosion. No more than approximately 2 hectares of the property will be open at any one time.
Policy 4-2 Regulation of land use activities	a. In order to achieve Objective 4-2 the Regional Council must regulate vegetation clearance, land disturbance, forestry and cultivation through rules in this Plan and decisions on resource consents, so as to minimise the risk of accelerated erosion, minimise discharges of sediment to water, and maintain the benefits of riparian vegetation for water bodies. b. Territorial Authorities may regulate, through rules in district plans and decisions on resource consents, the actual or potential effects of the use, development, or protection of land, in order to achieve Objective 4-2. However, Territorial	Vegetation clearance and earthworks will be controlled in accordance with the regional plan and district plan requirements and appropriate erosion and sediment controls to ensure the proposal is consistent with Objective 4-2. The vegetation cleared will be replaced by suitable native species over much of the property resulting in positive effects from the proposed works.

	Authorities must not have rules that are contradictory to the rules in this Plan that control the use of land. c. The Regional Council will generally allow small scale vegetation clearance, land disturbance, forestry and cultivation to be undertaken without the need for a resource consent if conditions are met. Vegetation clearance and land disturbance require a resource consent if they are undertaken adjacent to some water bodies (including certain wetlands) in Hill Country Erosion Management Areas or in coastal foredune areas. Any other large scale land disturbance will also require a resource consent.	
Chapter 5: Water		
Reference	**Text**	**Comment**
Objective 5-1 Water management Values	Surface water bodies and their beds are managed in a manner which safeguards their life supporting capacity and recognises and provides for the Values in Schedule B1.	The proposed activities will be undertaken in a way that safeguards the life supporting capacity and the Schedule B Values of surface water bodies, as detailed in the policy assessment below.
Objective 5-2 Water quality	a. Surface water quality is managed to ensure that: i. water quality is maintained in those rivers and lakes where the existing water quality is at a level sufficient to support the Values in Schedule B ii. water quality is enhanced in those rivers and lakes where the existing water quality is not at a level sufficient to support the Values in Schedule B iii. accelerated eutrophication and sedimentation of lakes in the Region is prevented or minimised iv. the special values of rivers protected by water conservation orders are maintained. b. Groundwater quality is managed to ensure that existing groundwater quality is maintained or where it is	Objective 5-2 seeks to manage the quality of the region's surface and groundwater to ensure the values in Schedule B to the One Plan are supported either through maintenance of existing quality or, if required enhancement of substandard quality. There will be no discharge of either sediment from earthworks or from discharge of treated domestic wastewater to surface water. Activities are either setback far enough from surface water or will be managed through the implementation of an approved erosion and sediment control plan to ensure no uncontrolled or accidental discharge to surface water occurs. I understand groundwater recharge rates from the pump test data are considered to be adequate and saltwater intrusion is not considered likely. I therefore consider the proposal to be consistent with One Plan

	degraded/over allocated as a result of human activity, groundwater quality is enhanced.	Objective 5-2.
Objective 5-3 Water quantity and allocation	*Water* quantity is managed to enable people, industry and agriculture to take and use *water* to meet their reasonable needs while ensuring that: a. … b. For groundwater: i. takes do not cause a significant adverse effect on the long-term groundwater yield ii. groundwater takes that are hydrologically connected to rivers, are managed within the minimum flow and allocation regimes established for rivers iii. groundwater takes that are hydrologically connected to lakes or wetlands are managed to protect the life-supporting capacity of the lakes or wetlands iv. the significant adverse effects of a groundwater take on other groundwater and surface water takes are avoided v. saltwater intrusion into coastal aquifers, induced by groundwater takes, is avoided. c. In all cases, water is used efficiently.	No surface water take is proposed. The groundwater take sought is a product of the maximum flow rate of the pump test from the well drilled on site. A maximum flow rate of 16.07 litres per second was recorded and was limited by the performance constraints of the test pump. The Bay Geological Services report submitted with the application states that: "*It is considered that pumping the Applicant's Well at a constant rate of 16.07 l/s over 150 days is likely to result in tolerable well interference effects in deep gravel aquifer bores due to the available head of water, and effects on the environment are considered no more than minor. It should be noted that there are no other wells at this depth within the near vicinity of the pumped Well and therefore adverse effects on nearby bores is not expected.*" As such, I consider the proposed take will not cause significant adverse effects on the long-term groundwater yield. The Bay Geological Services report also confirms: "*The confined nature of the aquifer producing from a deep gravel unit and the relatively low flow rate (16.06 l/s) resulting in moderate drawdown suggests that the risk of saline intrusion would be low*" I therefore consider saltwater intrusion will be avoided. Potable water supply to the property will be supplemented by rainwater collection from roofs to reduced demand from groundwater.

		Based on the above, the assessment in the application documents and the evidence of Alexandra Johansen, I consider the proposal to be consistent with One Plan Objective 5-3.
Objective 5-4 Beds of rivers and lakes	The beds of rivers and lakes will be managed in a manner which: a. sustains their life supporting capacity b. provides for the instream morphological components of natural character c. recognises and provides for the Schedule B Values d. provides for infrastructure and flood mitigation purposes. The land adjacent to the bed of reaches with a Schedule B Value of Flood Control and Drainage will be managed in a manner which provides for flood mitigation purposes.	No change is proposed to the bed of any river of lake. For reasons already outlined, I do not consider there will be any increase in discharges to the bed of the Ōhau River. The natural character of the river, including the natural character of the saltmarsh wetland within the application property will be maintained. There will be no effect on the provision for infrastructure or flood mitigation measures. I therefore consider the proposed activities to be consistent with One Plan Objective 5-4.
Policy 5-10 Point source discharges to land	Discharges of contaminants onto or into land must be managed in a manner which: a. does not result in pathogens or other toxic substances accumulating in soil or pasture to levels that would render the soil unsafe for agricultural, domestic or recreational use b. has regard to the strategies for surface water quality management set out in Policies 5-3, 5-4 and 5-5, and the strategy for groundwater management set out in Policy 5-6 c. maximises the reuse of nutrients and water contained in the discharge to the extent reasonably practicable d. results in any discharge of liquid to land generally not exceeding the available water storage capacity of the soil (deferred irrigation) e. ensures that adverse effects on rare habitats, threatened habitats and at-risk habitats are avoided, remedied or mitigated.	The Engineering Services Report included with the application document provides detailed wastewater calculations to determine the requirements for a suitable on-site wastewater system that meet the Horizons Regional Council manual for On-site wastewater systems design and management. The disposal fields will be located in areas away from the Ōhau River and identified areas of freshwater to be protected. The discharge fields will be integrated into the site development.
Policy 5-11	Notwithstanding other policies in this chapter: a. before entering a surface water body all new discharges of treated human sewage must:	The on-site wastewater system to be used for the proposed development will meet the standards for treated domestic

Human sewage discharge	i. be applied onto or into land, or ii. flow overland, or iii. pass through an alternative system that mitigates the adverse effects on the mauri of the receiving water body, and b. all existing direct discharges of treated human sewage into a surface water body must change to a treatment system described under (a) by the year 2020 or on renewal of an existing consent, whichever is the earlier date.	wastewater set out in the Horizons One Plan and the manual for On-site wastewater systems design and management.
Policy 5-20 Overall approach for bore management and groundwater allocation	a. New bores must be constructed and managed in accordance with Policy 16-4. b. Groundwater Management Zones are mapped in Schedule D. c. Total groundwater allocations must comply with the annual allocable volumes for Groundwater Management Zones set out in Policy 5-21. d. The measured or modelled effects of a proposed groundwater take on other groundwater users, surface water bodies and saltwater intrusion must be managed in accordance with Policies 16-1, 16-5, 16-6 and 16-7.	All bores have already been consented. In all cases construction will be managed in accordance with relevant policy and the existing consents.
Policy 5-21 Groundwater Management Zones	The total amount of consented groundwater allocated from each Groundwater Management Zone mapped in Schedule D must not exceed the annual allocable volume for the GWMZ specified in Schedule D.	The proposed groundwater take will not exceed the allocation.
Policy 5-22 General management of the beds of rivers and lakes	Activities in, on, under or over the beds of rivers and lakes must generally be managed in a manner which: a. recognises and provides for the Schedule B Values for the Water Management Sub-zones in which the activity takes place, in the manner described in Policies 5-23, 5-24 and 5-25 b. avoids any significant reduction in the ability of a river and its bed to convey flood flows, or significant impedance to the passage of floating debris	No change is proposed to the bed of any river of lake. For reasons already outlined, I do not consider there will be any increase in discharges to the bed of the Ōhau River. The natural character of the river, including the natural character of the saltmarsh wetland within the application property will be maintained. There will be no effect on the provision for infrastructure or flood mitigation measures.

	c. avoids, remedies or mitigates any significant adverse effects on the stability and function of the beds of rivers and lakes, and existing structures including flood and erosion control structures d. avoids, remedies or mitigates any significant reduction in the habitat diversity, including the morphological diversity, of the river or lake or its bed e. manages effects on natural character and public access in accordance with the relevant policies in Chapter 6. Natural character can include the natural style and dynamic processes of the river, such as bed style and width and the quality and quantity of bed habitat f. provides for the safe passage of fish both upstream and downstream g. ensures that the existing nature and extent of navigation of the river or lake are not obstructed h. ensures that access required for the operation, maintenance, and upgrade of infrastructure and other physical resources of regional or national importance is not obstructed i. provides for continued public access in accordance with Policy 6-10.	The flood flow capacity of the Ōhau River will not be affected and no flood management or erosion control measures would be under any increased pressure as a result of the proposed activities. Habitat and morphological diversity are matters addressed by Vaughan Keesing and Jim Dahm. Chapter 6 policies are addressed below. Fish passage within the river will not be impeded. Public access to the river will not change. I consider the proposal to be consistent with Policy 5-22.
Policy 5-23 Activities in sites with a Value of Natural State, Sites of Significance - Cultural, or Sites of Significance - Aquatic	In sites with a Schedule B Value of Natural State, Sites of Significance - Cultural or Sites of Significance - Aquatic, activities in, on, under or over the beds of rivers and lakes must be managed in a manner which: a. avoids adverse effects on these Values in the first instance, or b. for infrastructure and other resources of regional and national importance, or activities that result in an environmental benefit, remedies or mitigates those effects where it is not practicable to avoid them, and	The lower Ōhau River is identified as having Schedule B value of Sites of Significance – Aquatic. The specific species references in Table B.3 confirm these values are upstream of the application site. The evidence of Vaughan Keesing addresses the potential effect on aquatic habitats and considers it to be low. In addition the effects of the proposed works on the banks of the Ōhau River, and its Schedule B values have been determined to be low.

	c. maintains the habitat and spawning requirements of the species identified.	The proposal will have less than minor effects on identified Schedule B values or water quality and quantity in the river itself.
Policy 5-24 Activities in rivers or lakes and their beds with a Value of Flood Control and Drainage	In reaches of rivers or lakes and their beds with a Schedule B Value of Flood Control and Drainage, activities in, on, under or over the beds of rivers and lakes and on land adjacent to the bed where the Value is located must be managed in a manner which: a. enables the degree of flood hazard and erosion protection existing at the time of Plan notification (31 May 2007) to be maintained or enhanced b. addresses adverse effects by: i. in the first instance, avoiding, remedying or mitigating adverse effects on the instream morphological components of natural character and other Schedule B Values ii. providing consent applicants with the option of making an offset iii. allowing compensation by way of a financial contribution in accordance with the policies in Chapter 19.	The proposed activity will have no effect on the Ōhau River's identified flood control and drainage values. The form and function of the river will be retained throughout development and operation of the proposed activities.
Policy 5-25 Activities in rivers or lakes and their beds with other Schedule B Values	In sites with Schedule B Values other than Natural State, Sites of Significance - Cultural, Sites of Significance - Aquatic, or Flood Control and Drainage, activities in, on, under or over the beds of rivers and lakes must be managed in a manner which: a. in the first instance avoids, remedies or mitigates significant adverse effects on the instream morphological components of natural character and Schedule B Values b. provides consent applicants with the option of making an offset c. allows compensation by way of a financial contribution in accordance with the policies in Chapter 19.	The lower Ōhau River is identified as having Schedule B value of Sites of Significance – Aquatic. The specific species references in Table B.3 confirm these values are upstream of the application site. The evidence of Vaughan Keesing addresses the potential effect on aquatic habitats and considers it to be low. In addition the effects of the proposed works on the banks of the Ōhau River, and its Schedule B values have been determined to be low. No significant adverse effects on the instream morphological components of natural character and Schedule B Values have been identified.

Chapter 6: Indigenous Biological Diversity, Landscape and Historic Heritage		
Reference	**Text**	**Comment**
Objective 6-1 Indigenous *biological diversity*	Protect areas of significant indigenous vegetation and significant habitats of indigenous fauna and maintain indigenous *biological diversity*, including enhancement where appropriate.	The Applicant requested that Horizons' ecologist undertake a site visit, report on and map areas of significant indigenous vegetation on the property. The findings of that report and the mapping of significant areas has informed and led the design of the golf course and the revegetation management plan for the property. The Applicant's ecologists (Boffa Miskell) have used the Horizons Schedule F assessment and further on-site investigations to provide finer grained Schedule F mapping for the site. The evidence of Vaughan Keesing better details the process and the findings of that assessment. The outcomes of the refined Boffa Miskell Schedule F mapping and the assessment is provided in the Boffa Miskell memorandum dated 22 November 2021, which confirms: "*Community 5 was presented well in the AEE and is not representative in canopy or middle or ground tier of the expected native dune ridge and dune hollow communities. This is unsurprising given the extensive long term levels of modification. These areas do not fit schedule F criteria for while they have the geo-morphology of dune and dune hollow, they do not have the appropriate native vegetation of those communities, and are and will continued to be outside of the schedule F boundary. Furthermore, the plot and photo data show that the areas within the wider type 5 which were initially labelled type 9 knobbly club rush are not those but are actually exotic scrub and shrub and the map changes … now reflect this. Hole 14, active dune area is now recognised by plots as exotic scrub (lupin) and has virtually no representativeness value and is properly reflected in the mapping … and a new assessment of effect is presented which is an overall level of very low. No katipo were found in area 14 or the wider grid searches in other areas (katipo were found in wood debris outside of the subject area).*

		No lizards were found or seen and it remains strongly the observation that the heavy mouse and hedgehog populations observed in the critapics as well as the history of site modification, and absence in any in the initial survey method undertaken, is because there are only very low populations of northern grass skink and no other taxa. This presence (northern grass skink) in low abundance does not result in a value change from that already expressed, what it does is cause a need through the wildlife act to salvage these lizards if their habitat is to be sufficiently disturbed. *The impacts of the golf course as proposed are less than minor the level of effect on all communities affected is very low.* [The updated Schedule F mapping shows] … *that the restoration is in in largely exotic low value communities and not in any valued indigenous dominated areas. This ensures the outcomes of the restoration are truly site beneficial and progressing communities that otherwise have not and would not gain additional indigenous dominance or habitat value."*[1] Based on the extensive on site assessment and mapping work undertaken by Boffa Miskell, in my opinion the identified areas of significant indigenous vegetation and significant habitats of indigenous fauna are protected and indigenous biological diversity is maintained and, where appropriate enhanced and that the proposal is consistent with One Plan Objective 6-1.
Objective 6-2 Outstanding natural features and landscapes,	a. The characteristics and values of: i. the Region's outstanding natural features and landscapes, including those identified in Schedule G, and	The landscape assessment prepared by Frank Boffa and submitted with the application states that: *The reviewed assessment confirms that in line with the District Plan assessment, there are no areas of outstanding natural character within the Douglas Links site. The District Plan also indicates there are no areas of outstanding natural character along the*

[1] Boffa Miskell memorandum dated 22 November 2021

and natural character	ii. the natural character of the coastal environment, wetlands, rivers and lakes and their margins are protected from inappropriate subdivision, use and development. b. Adverse effects, including cumulative adverse effects, on the natural character of the coastal environment, wetlands, rivers and lakes and their margins, are: i. avoided in areas with outstanding natural character, and ii. avoided where they would significantly diminish the attributes and qualities of areas that have high natural character, and iii. avoided, remedied or mitigated in other areas. c. Promote the rehabilitation or restoration of the natural character of the coastal environment, *wetlands*, *rivers* and *lakes* and their margins.	*Horowhenua Coast. The review confirms that while there are areas of very high natural character within the Douglas Links site, there are no areas of outstanding natural character within the site. The areas identified in this assessment as having very high natural character include the active coastal foredune and the salt marsh wetland on the Ohau River.* And that: *… in terms of Coastal Environment considerations, the proposed development –* • *Will preserve the natural character of the Coastal Environment.* • *Will increase and enhance the levels of natural character throughout the site.* • *Recognises and respects the sensitivities and dynamics of the coastal dune landscape.* • *Embraces opportunities to restore and rehabilitate the natural character of the site and its adjacent coastal edge.* *That in terms of visual effects considerations, the proposed development –* • *Will not create adverse visual or amenity effects from locations within or beyond the site.* • *Will enhance the visual amenity of the landscape in the context of its coastal setting.* Further, the *Coastal processes and vegetation report* advises that in the dune environment: *…restoration work to offset these losses should focus on the dune vegetation seaward of the proposed course. This work will have much higher ecological value than planting small patches of native*

		vegetation within the course itself. The ecological benefits will also increase over time as the shoreline continues to extend seaward, widening the area of native dune vegetation and habitat by around 15-16m every decade. As noted above, at present, native-dominated communities are limited to the nearshore areas with serious (and, over time, increasing) weed invasion in the more landward areas. And that in the estuarine environment: *…restoration in this area focus on:* • *Improved management of existing vehicle use, ideally containing any use to a narrow defined track landward of the estuarine area and associated riparian vegetation* • *Restoration of a native riparian vegetation sequence around the landward margins of the saltmarsh, using such species as oioi, saltmarsh ribbonwood, and flax* • *Removal of exotic vegetation (particularly around the riparian margin and also the grass invasion of some parts of the saltmarsh).* Based on this advice it is my view that: ● There are no outstanding natural features or landscapes affected by the proposed activities; ● Adverse effects on the natural character of the coastal environment (including cumulative effects) will be, for reasons I deal later, minor; ● Restoration and revegetation activities that are an integral part of the proposed activities will rehabilitate and restore the natural character of the coastal environment; and ● The proposal is therefore consistent with Objective 6-2.

Policy 6-2 Regulation of activities affecting indigenous *biological diversity*	For the purpose of managing indigenous *biological diversity* in the Region: a. Habitats determined to be rare habitats and threatened habitats under Schedule F must be recognised as areas of significant indigenous vegetation or significant habitats of indigenous fauna. b. At-risk habitats that are assessed to be significant under Policy 13-5 must be recognised as significant indigenous vegetation or significant habitats of indigenous fauna. c. The Regional Council must protect rare habitats, threatened habitats and at-risk habitats identified in (a) and (b), and maintain and enhance other at-risk habitats by regulating activities through its regional plan and through decisions on resource consents. d. Potential adverse effects on any rare habitat, threatened habitat or at-risk habitat located within or adjacent to an area of forestry must be minimised. e. When regulating the activities described in (c) and (d), the Regional Council must, and when exercising functions and powers described in Policy 6-1, Territorial *Authorities* must: i. allow activities undertaken for the purpose of pest plant and pest animal control or habitat maintenance or enhancement, ii. consider indigenous *biological diversity* offsets in appropriate circumstances as defined in Policy 13-4, iii. allow the maintenance, operation and upgrade of existing structures, including infrastructure and other	The applicant requested HRC ecologist to undertake a site visit, report on and map areas of significant indigenous vegetation on the property. Boffa Miskell has also undertaken a Schedule F significance assessment as part of its Ecological Survey. The findings of those reports and the mapping of significant areas has informed and led the design of the golf course and the revegetation management plan for the property. The evidence of Vaughan Keesing outlines the potential level of effect on rare, threatened or at-risk habitats and confirms that these effects will be no more than minor. As set out in the Eco Nomos report, the evidence of Jim Dahm and the draft restoration plan the golf course activities provide opportunities for coastal and estuarine vegetation restoration in other areas of the property. The proposed activities will assist with the removal of pest and weed species. I therefore consider the proposal is consistent with Policy 6-2.

	physical resources of regional or national importance as identified in Policy 3-1, and iv. not unreasonably restrict the existing use of production land where the effects of such land use on rare habitat, threatened habitat or at-risk habitat remain the same or similar in character, intensity and scale.	
Policy 6-3 Proactive management of indigenous *biological diversity*	a. The Regional Council will aim to maintain or enhance indigenous *biological diversity* by working in partnership with relevant landowners, other parties with a legal interest in the *land*, and relevant consent holders to establish a management plan and incentive programme for the voluntary proactive management of identified sites by 2016. b. For the purposes of (a), separate programmes will be established for *wetlands*, bush remnants, native fish communities and coastal ecosystems. c. The management plans under (a) will generally address the following matters as a minimum: i. fencing and prevention of stock access ii. pest plant and pest animal control iii. planting iv. agreed land uses v. work and materials to be provided by the Regional Council or a third party vi. financial assistance to be provided by the Regional Council or a third party	The Applicant is willing to continue to work with Horizons Regional Council to investigate opportunities to maintain and/or enhance indigenous biological diversity.

	vii. monitoring viii. legal options for ensuring longevity of the measures implemented.	
Policy 6-4 Fostering an ethic of stewardship	The Regional Council will equip landowners and others with the information they need to act as good stewards for indigenous biodiversity, and to act responsibly and proactively. These initiatives will be additional to the Council-led programmes under Policy 6-3.	The proposed activities, including on-going management of the land, provide for good indigenous biodiversity stewardship through the removal of pest and weed species and the provision of additional native vegetation on the property.
Policy 6-5 Pest plants and pest animals	a. To the extent that they relate to the maintenance of indigenous biodiversity, the pest plant and pest animal management functions of the Regional Council will primarily target pests threatening rare habitats, threatened habitats and at-risk habitats b. When exercising functions and powers as set out in Policy 6-1, Territorial Authorities must take into account the risks of introducing pest plants or pest animals into rare habitats, threatened habitats, at-risk habitats and nearby areas.	The proposed activities will assist with the removal of pest, exotic and invasive species within the property.
Policy 6-6 Regionally outstanding natural features and landscapes	The natural features and landscapes listed in Schedule G Table G.1 must be recognised as regionally outstanding and must be spatially defined in the review and development of district plans. All subdivision, use and development directly affecting these areas must be managed in a manner which: a. avoids significant adverse cumulative *effects* on the characteristics and values of those outstanding natural features and landscapes, and b. except as required under (a), avoids adverse *effects* as far as reasonably practicable and, where avoidance is not reasonably practicable, remedies or mitigates adverse *effects* on the	As stated in the Landscape Assessment submitted with the application: ***Coastal Outstanding Natural Features and Landscape*** *Relative to the Douglas Links site, the Coastal ONFL identified in the District Plan generally incorporates both the coastal foredune and the more detailed stable secondary dunes that extend from the mean high water through and into the exotic tree plantings associated with the stable secondary dunes. As the original mapping of the ONFL was based on 1:50,000 contour mapping, the identified area generally appears to follow a line some 300-350m inland from mean high water.*

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<td>characteristics and values of those outstanding natural features and landscapes.</td>
<td>Following several site visits and a review of more recent and more detailed topographic and aerial photography, a refined ONFL boundary has been prepared. The purpose of reviewing the ONFL boundary was not to dispute the District Plan line, it was simply reviewed in order to update the line based on more detailed and recent data, and an acknowledgment that landscape change has occurred subsequent to what was identified in 2012.</td>
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<td>Policy 6-7
Assessing outstanding natural features and landscapes</td>
<td>The Regional Council and Territorial Authorities must take into account but not be limited to the criteria in Table 6.1 when:
a. identifying outstanding natural features and landscapes, and consider whether the natural feature or landscape is conspicuous, eminent, remarkable or otherwise outstanding, and
b. considering adding to, deleting from, or otherwise altering, redefining or modifying the list of outstanding natural features or landscapes listed in Table G.1 of Schedule G, or
c. considering the inclusion of outstanding natural features or landscapes into any district plan, or
d. establishing the relevant values to be considered when assessing effects of an activity on:
i. outstanding natural features and landscapes listed in Table G.1 of Schedule G, or
ii. any other outstanding natural feature or landscape.

Table 6.1 Natural Feature and Landscape Assessment Factors
<table><tr><th>Assessment factor</th><th>Scope</th></tr><tr><td>(a) Natural science factors</td><td>These factors relate to the geological, ecological, topographical and natural process components of the natural feature or landscape:</td></tr></table></td>
<td>Design of the proposed golf course and ancillary buildings and activities used a first principles approach to the protection of natural character (including the coastal environment, wetlands and the Ōhau River) natural features and landscapes considered to be outstanding or of significant value. This included use of the existing district-level maps of features and landscapes and fine-tuning the definition of those features and landscapes with aerial mapping and on-site walkovers.

Course design followed an iterative process involving all members of the project team with adjustments made where necessary and at the recommendation of the Applicant’s experts to ensure features of value or significance are protected and/or enhanced.

The Applicant also invited Horizons Regional Council ecologists to map and assess on sites and habitats of ecological value on the site prior to development of the course design.

Development of the golf course layout and design followed on from this fine-grained site assessment and has taken full account of the natural character, features and landscapes of significant value and measures have been put in place to ensure those areas are protected from inappropriate use and development.

In some cases, enhancement of those features will be generated by the proposal through the removal of weed and exotic vegetation species within some of those features, replanting with native and more suitable species (as shown in the draft restoration plan) and</td>
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			i. Representative: the combination of natural components that form the feature or landscape strongly typifies the character of an area. ii. Research and education: all or parts of the feature or landscape are important for natural science research and education. iii. Rarity: the feature or landscape is unique or rare within the district or Region, and few comparable examples exist. Ecosystem functioning: the presence of healthy ecosystems is clearly evident in the feature or landscape.	some augmentation of those areas through additional native plantings around the edges of the existing features of significant value on the property.
		(b) Aesthetic values	The aesthetic values of a feature or landscape may be associated with: i. Coherence: the patterns of land cover and land use are largely in harmony with the underlying natural pattern of landform and there are no, or few, discordant elements of land cover or land use. ii. Vividness: the feature or landscape is visually striking, widely recognised within the local and wider community, and may be regarded as iconic. iii. Naturalness: the feature or landscape appears largely unmodified by human activity and the patterns of landform and land cover are an expression of	

		natural processes and intact healthy ecosystems. iv. Memorability: the natural feature or landscape makes such an impact on the senses that it becomes unforgettable.
	(c) Expressiveness (legibility)	The feature or landscape clearly shows the formative natural processes or historic influences that led to its existing character.
	(d) Transient values	The consistent and noticeable occurrence of transient natural events, such as daily or seasonal changes in weather, vegetation or wildlife movement, contributes to the character of the feature or landscape.
	(e) Shared and recognised values	The feature or landscape is widely known and is highly valued for its contribution to local identity within its immediate and wider community.
	(f) Cultural and spiritual values for *tangata whenua*	Māori values inherent in the feature or landscape add to the feature or landscape being recognised as a special place.
	(g) Historic Heritage values	Knowledge of historic events that occurred in and around the feature or landscape is widely held and substantially influences and adds to the value the community attaches to the natural feature or landscape. Heritage features, *sites* or structures that are present and add to the enjoyment and understanding of the feature or landscape.

Policy 6-8 Natural character	a. The natural character of the coastal environment, *wetlands, rivers* and *lakes* and their margins must be preserved and these areas must be protected from inappropriate subdivision, use and development. b. The natural character of these areas must be restored and rehabilitated where this is appropriate and practicable. c. Natural character of these areas may include such attributes and characteristics as: i. Natural elements, processes and patterns, ii. Biophysical, ecological, geological, geomorphological and morphological aspects, iii. Natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks, iv. The natural movement of water and sediment including hydrological and fluvial processes, v. The natural darkness of the night sky, vi. Places or areas that are wild and scenic, vii. A range of natural character from pristine to modified, and viii. Experiential attributes, including the sounds and smell of the sea; and their content or setting.	The proposal will result in less than minor adverse effects on the natural character of the coastal environment, wetlands, rivers or lakes. The Ōhau River and saltmarsh wetland will be protected throughout the development proposed. The coastal environment assessment in the Landscape Assessment submitted with the resource consent applications states: *That in terms of Coastal Environment considerations, the proposed development –* • *Will preserve the natural character of the Coastal Environment.* • *Will increase and enhance the levels of natural character throughout the site.* • *Recognises and respects the sensitivities and dynamics of the coastal dune landscape.* • *Embraces opportunities to restore and rehabilitate the natural character of the site and its adjacent coastal edge.*
Policy 6-9 Managing natural character	In relation to the natural character of: a. the component of the coastal environment which is not coastal marine *area* (CMA), and b. *wetlands, rivers* and lakes and their margins subdivision, use or development must generally (but without limitation) be considered appropriate if it:	No part of the proposed activities will be within the CMA. The coastal environment assessment in the Landscape Assessment submitted with the resource consent applications states: *That in terms of Coastal Environment considerations, the proposed development –* • *Will preserve the natural character of the Coastal Environment.*

	c. is compatible with the existing level of modification to the environment, d. has a functional necessity to be located in or near the component of the coastal environment which is not coastal *marine area* (CMA), *wetland, river or lake* and no reasonably practicable alternative locations exist, e. is of an appropriate form, scale and design to be compatible with the existing landforms, geological features and vegetation, f. will not, by itself or in combination with *effects* of other activities, significantly disrupt natural processes or existing ecosystems, and g. will provide for the restoration and rehabilitation of natural character where that is appropriate and practicable.	• *Will increase and enhance the levels of natural character throughout the site.* • *Recognises and respects the sensitivities and dynamics of the coastal dune landscape.* • *Embraces opportunities to restore and rehabilitate the natural character of the site and its adjacent coastal edge.* There is a demonstrable functional need for the coastal location for the proposed activity given links golf courses are, by their nature, located on the marginal coastal land behind the foredunes. The coastal environment assessment goes on: *The proposed Douglas Links Golf Course will –* • *Have no adverse effects on the environment that cannot be readily mitigated, and will in fact enhance the landscape character, biodiversity habitat and the amenity values of the coastal landscape.* • *Will restore and rehabilitate degraded and vulnerable landscapes and vegetation, particularly along the coastal margin.* • *Will protect and enhance natural character values throughout the site.* I consider this demonstrates consistency with Policy 6-9.
Chapter 9: Natural Hazards		
Reference	**Text**	**Comment**
Objective 9-1 Effects of natural hazard events	The adverse effects of natural hazard events on people, property, infrastructure and the wellbeing of communities are avoided or mitigated.	The adverse effects of natural hazard events on people, property, infrastructure and the wellbeing of communities has been considered in the design of the proposed development and is considered against the relevant policies below.

Policy 9-2 Development in areas prone to flooding	a. ... b. Outside of a floodway mapped in Schedule J the Regional Council and Territorial Authorities must not allow the establishment of any new structure or activity, or an increase in the scale of any existing structure or activity, within an area which would be inundated in a 0.5% AEP (1 in 200 year) flood event unless: i. flood hazard avoidance is achieved or the 0.5% AEP (1 in 200 year) flood hazard is mitigated, or ii. the non-habitable structure or activity is on production land, or iii. there is a functional necessity to locate the structure or activity within such an area, in any of which cases the structure or activity may be allowed. c. Flood hazard avoidance must be preferred to flood hazard mitigation. d. When making decisions under Policies 9-2(a) and b(i) regarding the appropriateness of proposed flood hazard mitigation measures, the Regional Council and Territorial Authorities must: i. ensure that occupied structures have a finished floor or ground level, which includes reasonable freeboard, above the 0.5% AEP (1 in 200 year) flood level. ii. ensure that in a 0.5% AEP (1 in 200 year) flood event2 the inundation of access between occupied structures and a safe area where evacuation may be carried out (preferably ground that will not be flooded) must be no greater than 0.5 m above finished ground level with a maximum water velocity of 1.0 m/s, or some other combination of water depth and velocity that can be	No structures or activity, or increase in the scale of any existing structure or activity, will be located in an area that would be inundated in a 0.5% AEP (1 in 200 year) flood event. Small parts of the site along the Ōhau River have been identified as being susceptible to flooding. No significant activity will occur in this area. No sensitive activities (such as accommodation units) have been placed in areas of high risk from natural hazard events. As detailed in the evidence of others, the proposed activities will not adversely affect the sensitive frontal dune area in which most serious wind erosion issues develop. In terms of coastal erosion, the *Coastal process and vegetation* report submitted with the application outlines how the shoreline in this area is moving seaward at a rate of at least 0.5-1m per year. Coastal erosion is therefore not considered to pose a risk to the application property. The report outlines estuarine erosion along the margins of the Ōhau River as follows: *Available data suggests that, over long periods of time, the rate of bank erosion averages about 1-2 m/yr. The erosion is probably episodic, with significant erosion possible during major flood events, with periods of much lesser erosion between such events. Any parts of the golf course (fairways, tees etc.) located close to the river margin may periodically need to be moved due to erosion. The areas likely to be at highest risk from erosion with existing channel geometry are identified.* No golf course infrastructure is proposed in the existing channel geometry or in a location considered to be particularly susceptible to estuarine erosion. The only activities in close proximity to identified hazard areas are golf holes which can be easily relocated away from hazard areas

	shown to result in no greater risk to human life, infrastructure or property, iii. ensure that any more than minor adverse effects on the effectiveness of existing flood hazard avoidance or mitigation measures, including works and structures within River and Drainage Schemes, natural landforms that protect against inundation, and overland stormwater flow paths, are avoided, iv. ensure that adverse effects on existing structures and activities are avoided or mitigated, v. have regard to the likelihood and consequences of the proposed flood hazard mitigation measures failing, vi. have regard to the consequential effects of meeting the requirements of (d)(ii), including but not limited to landscape and natural character, urban design, and the displacement of floodwaters onto adjoining properties, and vii. have regard to the proposed ownership of, and responsibility for maintenance of, the flood hazard mitigation measures including the appropriateness and certainty of the maintenance regime. e. … f. … g. This policy does not apply to new critical infrastructure.	should the management level for coastal hazard require movement from these areas. The flood management capabilities of the river plain, including the identified saltmarsh wetland on the northern side of the Ōhau River, will be maintained and protected during and after the proposed development of the golf course. There will be no critical infrastructure near any area identified as being at risk from coastal hazards. The design of the development has avoided areas identified as being susceptible to flooding to remove the requirement for mitigation. No additional flood hazard mitigation is considered necessary in relation to the proposed development and the proposal is therefore considered to be consistent with Policy 9-2.
Policy 9-4 Other types of natural hazards	The Regional Council and Territorial Authorities must manage future development and activities in areas susceptible to natural hazard events (excluding flooding) in a manner which: a. ensures that any increase in risk to human life, property or infrastructure from natural hazard events is avoided where practicable, or mitigated where the risk cannot be practicably avoided,	The property is not considered to be particularly susceptible to any other types of natural hazard (excluding flooding). There will be no increase in risk to human life, property or infrastructure. No existing works, structures or landforms that act as mitigation measures will be affected by the proposal.

	b. is unlikely to reduce the effectiveness of existing works, structures, natural landforms or other measures which serve to mitigate the effects of natural hazard events, and c. is unlikely to cause a significant increase in the scale or intensity of natural hazard events.	There will be no increase in the scale or intensity of natural hazard events as a result of the proposed development.
Policy 9-5 Climate change	The Regional Council and Territorial Authorities must take a precautionary approach when assessing the effects of climate change and sea level rise on the scale and frequency of natural hazards with regard to decisions on: a. stormwater discharges and effluent disposal, b. coastal development and coastal land use, c. activities adjacent to rivers, d. water allocation and water takes, e. activities in a Hill Country Erosion Management Area, f. flood mitigation activities, and g. managing storm surge.	The precautionary approach to managing potential effects from the coastal location has been integral to the project design throughout development of the project. The coastline in this location is not particularly susceptible to coastal erosion and the potential effects of climate change have been taken into account and assessed as part of the project design. As detailed in the evidence of others, the proposed activities will not adversely affect the sensitive frontal dune area in which most serious wind erosion issues develop. In terms of coastal erosion, the *Coastal process and vegetation* report submitted with the application outlines how the shoreline in this area is moving seaward at a rate of at least 0.5-1m per year. Coastal erosion is therefore not considered to pose a risk to the application property. The report outlines estuarine erosion along the margins of the Ōhau River as follows: *Available data suggests that, over long periods of time, the rate of bank erosion averages about 1-2 m/yr. The erosion is probably episodic, with significant erosion possible during major flood events, with periods of much lesser erosion between such events. Any parts of the golf course (fairways, tees etc.) located close to the river margin may periodically need to be moved due to erosion. The areas likely to be at highest risk from erosion with existing channel geometry are identified.* The report considers in full the potential effect of climate change in combination with other contributing factors, including accretion

		along this stretch of the coast, to provide a comprehensive indication of the likely effects. No golf course infrastructure is proposed in the existing channel geometry or in a location considered to be particularly susceptible to estuarine erosion. I consider the proposed activities are sufficiently precautionary in their design to achieve the intent of Policy 9-5.

Regional Plan		
Chapter 12: General Objectives and Policies		
Reference	**Text**	**Comment**
Objective 12-1 Resource management in the Region	a. The regulation of activities in a manner which maximises certainty and avoids unnecessary costs on resource users and other parties. b. The regulation of activities in a manner which gives effect to the provisions of Part I of this Plan, the Regional Policy Statement.	The Applicant expects and anticipates the resource consent process to be undertaken with as much certainty as is possible in the circumstances and with the avoidance of unnecessary costs for all parties involved.
Objective 12-2 Consent duration, review and enforcement	a. The provisions of the RMA dealing with the duration of resource consents, review of consent conditions, and enforcement procedures must be implemented in a manner that provides the maximum reasonable certainty to resource users, affected parties and submitters. b. The Regional Council will provide user-friendly consents of appropriate duration and will carefully monitor and manage compliance.	For security of investment, discharge and water abstraction consents are sought for the maximum possible duration.
Chapter 13: Land Use Activities and Indigenous Biological Diversity		
Reference	**Text**	**Comment**

Objective 13-1 Accelerated erosion - regulation of vegetation clearance, land disturbance, forestry and cultivation	The regulation of vegetation clearance, land disturbance, forestry and cultivation in a manner that ensures: a. accelerated erosion and any associated damage to people, buildings and infrastructure and other physical resources of regional or national importance are avoided as far as reasonably practicable or otherwise remedied or mitigated, and b. increased sedimentation in water bodies as a result of human activity is avoided as far as reasonably practicable, or otherwise mitigated.	The proposed land disturbance will be undertaken in accordance with an approved Erosion & Sediment Control Plan (**ESCP**) which will ensure works do not contribute to accelerated erosion or uncontrolled discharge of sediment. Following construction the site will be stabilised through planting and other appropriate means.
Policy 13-1 Regional rules for vegetation clearance, land disturbance, forestry and cultivation	The Regional Council must: a. regulate vegetation clearance, land disturbance, forestry and cultivation through regional rules in accordance with Objectives 12-1, 12-2 and 13-1 and Policies 12-1 to 12-8, and b. manage the effects of vegetation clearance, land disturbance and cultivation by requiring resource consents for those activities: i. adjacent to some water bodies, ii. involving the removal of some woody vegetation in Hill Country Erosion Management Areas, iii. involving land disturbance or cultivation in Hill Country Erosion Management Areas, iv. involving large-scale land disturbance, or v. within the coastal foredune	The proposed land disturbance will be regulated appropriately through the resource consent process for earthworks and the application of an approved ESCP. The effects of the proposed land disturbance are assessed in the resource consent AEE. Care has been taken in particular to protect sensitive receiving environments including the Ōhau River and valued ecosystems. The subject property is not within a Hill Country Erosion Management Area and will protect the coastal foredune during and following works through appropriate erosion and sediment controls and revegetation.
Policy 13-2 Consent decision-making for vegetation clearance, land disturbance, forestry and cultivation	For vegetation clearance, land disturbance, forestry or cultivation and ancillary discharges to and diversions of surface water that requires resource consent under Rule 13-2, Rule 13-6 or Rule 13-7, the Regional Council must make decisions on consent applications and set consent conditions on a case-by-case basis, having regard to: a. the Regional Policy Statement, particularly Objective 4-2 and Policies 4-2 and 4-3,	Consent is sought for land disturbance and vegetation clearance within the coastal foredune but outside any identified at-risk or rare habitats under Rule 13-7. The application was accompanied by a draft ESCP which can be implemented as part of the construction works in accordance with Policy 13-2(b).

	b. managing the effects of land disturbance, including large-scale earthworks, by requiring Erosion and Sediment Control Plans or other appropriate plans to be prepared, c. managing the effects of forestry by requiring sustainable forestry management practices to be adopted and Erosion and Sediment Control Plans or other appropriate plans to be prepared, d. managing the effects of cultivation on water bodies through the use of sediment run-off control methods and setbacks from water bodies, e. the appropriateness of establishing infrastructure and other physical resources of regional or national importance as identified in Policy 3-1, f. generally allowing the clearance of woody vegetation on established pasture if that clearance will not lead to accelerated erosion or the increased sedimentation of water bodies, g. generally allowing activities that are for the purpose of managing natural hazards, including the reduction of flood risk, h. generally allowing forestry for soil conservation purposes, i. generally allowing activities that result in improved land stability or enhanced surface water quality, j. any relevant codes of practice, standards, guidelines, or environmental management plans and accepting compliance with them to the extent that they can be used as conditions on resource consents, k. sediment and erosion control measures required to reasonably minimise adverse effects, including those caused by rainfall and storm events, l. achieving integrated management through consents that are Region-wide or cover large areas for activities that	Implementation of the ESCP during construction, together with general best practice construction methods, will ensure the effects of land disturbance are appropriately managed.

	are widespread and undertaken by or on behalf of a single consent holder including, but not limited to, infrastructure and other physical resources of regional or national importance, or forestry, provided any such consents are subject to conditions, including review provisions, enabling site-specific matters to be addressed as necessary, and m. for activities involving an ancillary discharge to surface water, the matters in Policy 14-9.	
Objective 13-2 Regulation of activities affecting indigenous biological diversity	The regulation of resource use activities to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna or to maintain indigenous biological diversity, including enhancement where appropriate.	I have already addressed the measures proposed to protect significant indigenous vegetation and maintain indigenous biological diversity. The evidence of Vaughan Keesing also addresses this in greater detail. The golf course design has been through an iterative design process with many of the changes requested by members of the project team to protect and/or maintain sensitive of significant features, vegetation and biological diversity. Identified Schedule F habitat will predominantly be protected throughout the construction and maintenance of the proposed golf course. As detailed in the Boffa Miskell 22 November 2021 memo, golf course activities are *"in largely exotic low value communities and not in any valued indigenous dominated areas*". *The Boffa Miskell memorandum also states that "the outcomes of the restoration are truly site beneficial and progressing communities that otherwise have not and would not gain additional indigenous dominance or habitat value.*" It is my opinion that the iterative design process which has amended the course layout to that now proposed, combined with the "beneficial" restoration plan will ensure areas of significant indigenous vegetation and significant habitats of indigenous fauna are protected and indigenous biological diversity is maintained and

		in some cases enhanced. Consequently, I consider the proposed activities are consistent with Objective 13-2.
Policy 13-3 Regional rules for activities affecting indigenous biological diversity	The Regional Council must require resource consents to be obtained for vegetation clearance, land disturbance, cultivation, bores, discharges of contaminants into or onto land or water, taking, use, damming or diversion of water and activities in the beds of rivers or lakes within rare habitats, threatened habitats and at-risk habitats, and for forestry that does not minimise potential adverse effects on those habitats, through regional rules in accordance with Objectives 12-1, 12-2 and 13-2 and Policies 12-1 to 12-8.	The application documents included applications for resource consent for vegetation clearance, land disturbance, discharge to land and water take and includes a comprehensive assessment of the effects, including on any rare, threatened and at-risk habitats.
Policy 13-4 Consent decision-making for activities in rare habitats, threatened habitats and at-risk habitats	a. For activities regulated under Rule 13-8 and 13-9, the Regional Council must make decisions on consent applications and set consent *conditions* on a case-by-case basis: i. For all activities, having regard to: a. the Regional Policy Statement, particularly Objective 6-1 and Policy 6-2, b. a rare habitat or threatened habitat is an area of significant indigenous vegetation or a significant habitat of indigenous fauna, c. the significance of the area of habitat, in terms of its representativeness, rarity and distinctiveness, and ecological context, as assessed under Policy 13-5, d. the potential adverse effects of the proposed activity on significance, e. for activities regulated under ss13, 14 and 15 RMA, the matters set out in Policy 13-2(k) and relevant objectives and policies in Chapters 5, 14, 16 and 17, and	The applications under Rules 13-8 and 13-9 contain a full assessment against the relevant policy and an assessment of the environmental effects of the proposed land disturbance and vegetation clearance. The Applicant requested that Horizons' ecologist undertake a site visit, report on and map areas of significant indigenous vegetation on the property. The findings of that report and the mapping of significant areas has informed and led the design of the golf course and the revegetation management plan for the property. The Applicant's ecologists (Boffa Miskell) have used the Horizons Schedule F assessment and further on-site investigations to provide finer grained Schedule F mapping for the site. The evidence of Vaughan Keesing better details the process and the findings of that assessment. The significance of the habitats on site has been clearly assessed by Horizons Regional Council and Boffa Miskell ecologists and the need for the protection of significant habitats has guided the development design for the golf course.

	f. for activities involving a discharge, the matters in Policy 14-9. ii. For electricity transmission and renewable energy generation activities, providing for any national, regional or local benefits arising from the proposed activity. b. Consent must generally not be granted for resource use activities in a rare habitat, threatened habitat or at-risk habitat assessed to be an area of significant indigenous vegetation or a significant habitat of indigenous fauna under Policy 13-5, unless: i. any more than minor adverse effects on that habitat's representativeness, rarity and distinctiveness, or ecological context assessed under Policy 13-5 are avoided. ii. where any more than minor *adverse effects* cannot reasonably be avoided, they are remedied or mitigated at the point where the adverse *effect* occurs. iii. where any more than minor *adverse effects* cannot reasonably be avoided, remedied or mitigated in accordance with (b)(i) and (ii), they are offset to result in a net indigenous *biological diversity* gain. c. Consent may be granted for resource use activities in an at-risk habitat assessed not to be an area of significant indigenous vegetation or a significant habitat of indigenous fauna under Policy 13-5 when: i. there will be no significant *adverse effects* on that habitat's representativeness, rarity and	The outcomes of the refined Boffa Miskell Schedule F mapping and the assessment is provided in the Boffa Miskell memorandum dated 22 November 2021, which confirms: "*Community 5 was presented well in the AEE and is not representative in canopy or middle or ground tier of the expected native dune ridge and dune hollow communities. This is unsurprising given the extensive long term levels of modification. These areas do not fit schedule F criteria for while they have the geo-morphology of dune and dune hollow, they do not have the appropriate native vegetation of those communities, and are and will continued to be outside of the schedule F boundary. Furthermore, the plot and photo data show that the areas within the wider type 5 which were initially labelled type 9 knobbly club rush are not those but are actually exotic scrub and shrub and the map changes … now reflect this. Hole 14, active dune area is now recognised by plots as exotic scrub (lupin) and has virtually no representativeness value and is properly reflected in the mapping … and a new assessment of effect is presented which is an overall level of very low. No katipo were found in area 14 or the wider grid searches in other areas (katipo were found in wood debris outside of the subject area).* *No lizards were found or seen and it remains strongly the observation that the heavy mouse and hedgehog populations observed in the critapics as well as the history of site modification, and absence in any in the initial survey method undertaken, is because there are only very low populations of northern grass skink and no other taxa. This presence (northern grass skink) in low abundance does not result in a value change from that already expressed, what it does is cause a need through the wildlife act to salvage these lizards if their habitat is to be sufficiently disturbed.* *The impacts of the golf course as proposed are less than minor the level of effect on all communities affected is very low.*

	distinctiveness, or ecological context as assessed in accordance with Policy 13-5, or ii. any significant adverse *effects* are avoided. iii. where any significant *adverse effects* cannot reasonably be avoided, they are remedied or mitigated at the point where the adverse effect occurs. iv. where significant *adverse effects* cannot reasonably be avoided, remedied or mitigated in accordance with (c)(ii) and (iii), they are offset to result in a net indigenous *biological diversity* gain. d. An offset assessed in accordance with b(iii) or (c)(iv), must: i. provide for a net indigenous *biological diversity* gain within the same habitat type, or where that habitat is not an area of significant indigenous vegetation or a significant habitat of indigenous fauna, provide for that gain in a rare habitat or threatened habitat type, and ii. reasonably demonstrate that a net indigenous biological diversity gain has been achieved using methodology that is appropriate and commensurate to the scale and intensity of the residual adverse *effect*, and iii. generally be in the same ecologically relevant locality as the affected habitat, and iv. not be allowed where inappropriate for the ecosystem or habitat type by reason of its rarity, vulnerability or irreplaceability, and	[The updated Schedule F mapping shows] … *that the restoration is in in largely exotic low value communities and not in any valued indigenous dominated areas. This ensures the outcomes of the restoration are truly site beneficial and progressing communities that otherwise have not and would not gain additional indigenous dominance or habitat value.*" Policy 13-4(b) is particularly relevant for those parts of the proposed activities in Schedule F areas and states that: *Consent must generally not be granted for resource use activities in a rare habitat, threatened habitat or at-risk habitat assessed to be an area of significant indigenous vegetation or a significant habitat of indigenous fauna under Policy 13-5, unless:* *i. any more than minor adverse effects on that habitat's representativeness, rarity and distinctiveness, or ecological context assessed under Policy 13-5 are avoided.* *ii. where any more than minor adverse effects cannot reasonably be avoided, they are remedied or mitigated at the point where the adverse effect occurs.* iii. *where any more than minor adverse effects cannot reasonably be avoided, remedied or mitigated in accordance with (b)(i) and (ii), they are offset to result in a net indigenous biological diversity gain.* On the expert advice of Dr Keesing and his team of ecologists, I consider the proposed activities meet Policy 13-4 given that: i. More than minor adverse effects are avoided (meeting part (i)). ii. Those effects that have been identified (as less than minor) will have been mitigated through on-site restoration and

	v. have a significant likelihood of being achieved and maintained in the long term and preferably in perpetuity, and vi. achieve conservation outcomes above and beyond that which would have been achieved if the offset had not taken place.	management within those areas (meeting part (ii) even though that is not required); and iii. Net indigenous biological diversity gain will be provided as a result of the proposed activities as a result of the on-site restoration and rehabilitation proposed, including removal of weed and pest species from existing Schedule F areas (meeting part (iii) even though that is not required. Based on the extensive on-site assessment and mapping work undertaken by Boffa Miskell and the evidence of Vaughan Keesing, in my opinion the identified areas of significant indigenous vegetation and significant habitats of indigenous fauna are protected and indigenous biological diversity is maintained and, where appropriate enhanced and that the proposal is consistent with Policy 13-4.
Policy 13-5 Criteria for assessing the significance of, and the effects of activities on, an area of habitat	a. Rare habitats are areas of significant indigenous vegetation or significant habitats of indigenous fauna under criterion (ii)(E) below. Threatened habitats are areas of significant indigenous vegetation or significant habitats of indigenous fauna under criterion (i)(A) below. An area of rare habitat or threatened habitat may also be an area of significant indigenous vegetation or significant habitat of indigenous fauna under one or more of the other criteria below. An at-risk habitat may be recognised as being an area of significant indigenous vegetation or a significant habitat of indigenous fauna if one or more of the following criteria are met: i. in terms of representativeness, that habitat: a. comprises indigenous habitat type that is under-represented (20% or less of known or likely former cover), or	The evidence of Dr Keesing provides a comprehensive assessment of the significance of the effects of the proposed activities on identified habitats on, and in proximity of, the site. The criteria in Policy 13-5 has been followed in assessing that significance.

	b. is an area of indigenous vegetation that is typical of the habitat type in terms of species composition, structure and diversity, or that is large relative to other areas of the same habitat type in the Ecological District or Ecological Region, or has functioning ecosystem processes. or ii. in terms of rarity and distinctiveness, that habitat supports an indigenous species or community that: a. is classified as threatened (as determined by the New Zealand Threat Classification System and Lists), or b. is distinctive to the Region, or c. is at a natural distributional limit, or d. has a naturally disjunct distribution that defines a floristic gap, or e. was originally (ie., prehuman) uncommon within New Zealand, and supports an indigenous species or community of indigenous species. or iii. in terms of ecological context, that habitat provides: a. connectivity (physical or process connections) between two or more areas of indigenous habitat, or b. an ecological buffer (provides protection) to an adjacent area of indigenous habitat (terrestrial or aquatic) that is ecologically significant, or	

	c. part of an indigenous ecological sequence or connectivity between different habitat types across a gradient (eg., altitudinal or hydrological), or d. important breeding areas, seasonal food sources, or an important component of a migration path for indigenous species, or e. habitat for indigenous species that are dependent on large and contiguous habitats. b. The potential *adverse effects* of an activity on a rare habitat, threatened habitat or at-risk habitat must be determined by the degree to which the proposed activity will diminish any of the above characteristics of the habitat that make it significant, while also having regard to any additional ecological values and to the ecological sustainability of that habitat.	
Chapter 14: Discharges to Land and Water		
Reference	**Text**	**Comment**
Objective 14-1 Management of discharges to land and water and land uses affecting groundwater and surface water quality	The management of discharges onto or into land (including those that enter water) or directly into water and land use activities affecting groundwater and surface water quality in a manner that: a. safeguards the life supporting capacity of water and recognises and provides for the Values and management objectives in Schedule B, b. provides for the objectives and policies of Chapter 5 as they relate to surface water and groundwater quality, and	In all cases, discharges to surface water will be avoided and the life supporting capacity of water will be protected.

	c. where a discharge is onto or into land, avoids, remedies or mitigates adverse effects on surface water or groundwater.	
Policy 14-2 Consent decision-making for discharges to land	When making decisions on resource consent applications, and setting consent conditions, for discharges of contaminants onto or into land the Regional Council must have regard to: a. the objectives and policies of Chapter 5 regarding the management of groundwater quality and discharges, b. where the discharge may enter surface water or have an adverse effect on surface water quality, the degree of compliance with the approach for managing surface water quality set out in Chapter 5, c. avoiding as far as reasonably practicable any adverse effects on any sensitive receiving environment or potentially incompatible land uses, in particular any residential buildings, educational facilities, churches, marae, public areas, infrastructure and other physical resources of regional or national importance identified in Policy 3-1, wetlands, surface water bodies and the coastal marine area, d. the appropriateness of adopting the best practicable option to prevent or minimise adverse effects in circumstances where: i. it is difficult to establish discharge parameters for a particular discharge that give effect to the management approaches for water quality and discharges set out in Chapter 5, ii. the potential adverse effects are likely to be minor, and the costs associated with adopting the best practicable option are small in comparison to	No discharge to surface water is proposed. The proposed discharge area is well separated from any sensitive receiving environment or potentially incompatible land uses, such as residential buildings, educational facilities, churches, marae, public areas and infrastructure.

	the costs of investigating the likely effects on land and water, e. avoiding discharges which contain any persistent contaminants that are likely to accumulate in the soil or groundwater, and f. the objectives and policies of Chapters 2, 3, 6, 9 and 12, extent that they are relevant to the discharge.	
Policy 14-4 Options for discharges to surface water and land	When applying for consents and making decisions on consent applications for discharges of contaminants into water or onto or into land, the opportunity to utilise alternative discharge options, or a mix of discharge regimes, for the purpose of mitigating adverse effects, applying the best practicable option, must be considered, including but not limited to: a. discharging contaminants onto or into land as an alternative to discharging contaminants into water, b. withholding from discharging contaminants into surface water at times of low flow, and c. adopting different treatment and discharge options for different receiving environments or at different times (including different flow regimes or levels in surface water bodies).	Discharges will be to land and will be treated prior to discharge. No discharge to water is proposed.
Policy 14-7 Management of discharges of domestic wastewater	When making decisions on resource consent applications, and setting consent conditions, for on-site discharges of domestic wastewater, the Regional Council must generally ensure that the discharge is in accordance with the Manual for On-site Wastewater Systems Design and Management (Horizons Regional Council 2010). For discharges that are not in accordance with the Manual for On-site Wastewater Systems Design and Management (Horizons Regional Council 2010) the Regional Council must	Domestic wastewater will be treated prior to discharge and will be managed in accordance with the Manual for On-site Wastewater Systems Design and Management (Horizons Regional Council 2010).

	make decisions on resource consent applications, and set consent conditions, for on-site discharges of domestic wastewater, to ensure that: a. the site is suitable for the intended on-site wastewater management system, b. the discharge does not result in actual or potential contamination of: i. groundwater at any point of abstraction utilised for irrigation, stock or domestic drinking water, ii. surface water bodies, iii. stormwater drains, iv. artificial watercourses, or v. neighbouring property, c. the discharge does not constitute a public health threat, d. the discharge does not cause any offensive or objectionable odour beyond the property boundary, and e. a sufficient area of land is set aside as a reserve disposal area.	
Chapter 16: Takes, Uses and Diversions of Water, and Bores		
Reference	**Text**	**Comment**
Objective 16-1 Regulation of takes, uses and diversions of water	The regulation of takes, uses and diversions of water in a manner that: a. recognises and provides for the Values and management objectives in Schedule B, and b. provides for the objectives and policies of Chapter 5 as they relate to surface water and groundwater use and allocation.	The proposed water takes (for irrigation and potable supply) will be regulated and managed to ensure the values in Schedule B are recognised and provided for. An assessment against the relevant Chapter 5 objectives and policies is provided above.
Policy 16-1 Consent decision-making for takes and uses of	When making decisions on resource consent applications under s104-104D RMA, and setting consent conditions, for takes and uses of surface water or groundwater the Regional Council must:	No surface water take is proposed (other than the collection of roof water, for which no consent is required). The collection of roof water is considered to be a sustainable source of potable

surface water and groundwater	a. seek to avoid any adverse effects on other lawful activities, particularly on other surface water takes, including takes allowed by s14(3)(b) of the RMA, and groundwater takes from properly-constructed, efficient and fully-functioning bores (as described in Policies 16-4 and 16-5), b. enable non-consumptive uses of water including the use and recycling of water, and c. have regard to the objectives and policies of Chapters 2, 3, 5, 6, 9 and 12, extent that they are relevant to the activity.	water for buildings on the property and will minimise the required volume from groundwater. Based on the information available, including the further information submitted in support of the applications and the evidence of Alexandra Johansen, I considered the proposed groundwater abstraction will have minor or less than minor effects.
Policy 16-2 Consideration of alternative water sources	When making decisions on consent applications to take surface water, the opportunity to utilise alternative sources such as groundwater, water storage, water harvesting (including during periods of high flow in a river) and the recycling of water must be considered.	No surface water take is proposed. Water takes will be from groundwater (and rainwater collection) only.
Policy 16-5 Effects of groundwater takes on other groundwater takes	a. Consent applications to take groundwater must include pumping tests and hydrogeological assessments in order to determine the likely impact on existing groundwater takes in the vicinity. b. Consent conditions restricting the rate and duration of pumping must be imposed on new takes of groundwater where this is necessary to avoid significant drawdown impacts on existing groundwater takes from properly-constructed, efficient and fully-functioning bores in the vicinity. A groundwater take is considered to be from a properly-constructed, efficient and fully-functioning bore in circumstances where the bore penetrates the aquifer from which water is being drawn at a depth sufficient to enable water to be drawn all year (ie., the bore depth is below the range of seasonal fluctuations in	Pumping tests have been undertaken and a hydrological assessment prepared. All bores drilled will be drilled and constructed properly and will be cased and screened appropriately. At the rate of take required, it is considered the proposal will have no effects on any other groundwater takes in the vicinity.

	groundwater level), the pump and bore are adequately maintained, the bore is of sufficient diameter and is screened to reasonably minimise drawdown, and the bore has a pump capable of drawing water from its base to the land surface. c. Consent conditions specifying short-term restrictions on the rate and duration of pumping may also be imposed on new takes of groundwater where this is necessary to avoid significant drawdown impacts on existing bores that are not properly-constructed, efficient and fully-functioning, in order to allow sufficient time for such bores to be upgraded or replaced. d. The Regional Council may encourage consent applicants to consider the option of providing water to neighbouring properties in circumstances where this would be more practical than meeting the requirements of (b) or (c).	
Policy 16-6 Effects of groundwater takes on surface water bodies	The effects of groundwater takes on surface water bodies, including wetlands, must be managed in the following manner: a. An appropriate scientific method must be used to calculate the likely degree of connection between the groundwater and surface water at the location of the groundwater take. b. Subject to (a), the potential adverse effects of groundwater takes on surface water depletion must be managed in accordance with Table 16.1.	Although I understand surface water in the catchment is fully allocated, the pump test data and the assessment undertaken by Alexandra Johansen of Bay Geological Services Limited indicated that the proposed groundwater take is not hydrologically linked to surface water bodies and will have no effect on water quantity in surface bodies. I understand the proposed groundwater take will not deplete or otherwise affect surface water.
Policy 16-7 Saltwater intrusion	Saltwater intrusion along the coastal margins of the Region arising from groundwater takes must be managed by the following measures:	The Bay Geological Services report also confirms: "*The confined nature of the aquifer producing from a deep gravel unit and the relatively low flow rate (16.06 l/s) resulting in moderate drawdown suggests that the risk of saline intrusion*

	a. Consent applicants wishing to take groundwater within 5 km of the coastal mean high water springs line must be required to carry out pumping tests and hydrogeological assessments in order to determine the level of drawdown at the coast and the likelihood of inducing saltwater intrusion. b. In cases where saltwater intrusion might occur, the consent application may be declined or the amount of water that can be taken must be limited to an amount that restricts the likelihood of saltwater intrusion. c. In addition, consents to take groundwater within 5 km of the coastal mean high water springs line must contain conditions relating to the monitoring of electrical conductivity and the restriction or suspension of takes if specified electrical conductivity thresholds are reached or exceeded. These monitoring requirements and electrical conductivity thresholds will be determined on a case-by-case basis.	*would be low.*" Based on the information available, it is considered the potential for saltwater intrusion is low and the effects of the proposal will be less than minor.

Attachment 2

Further information provided to Horizons Regional Council under Section 92

- Further information dated 7 December 2021
- Further information dated 14 September 2021

14 September 2021

Horizons Regional Council
Private Bag 11025
Manawatū Mail Centre
PALMERSTON NORTH 4442

Attention: Fiona Morton

Dear Fiona

APP-2020203164.01 – Grenadier Limited – Further Information

Further to your letter dated 1 September 2021 regarding the above application, please find below and attached responses to the individual points.

Wastewater

1. Please see attached updated Engineering Report (Revision 2) with updated drawings, including an updated services and infrastructure drawing set (J709-ENG-130 to 134) which reflects the updated design and information provided to GWRC on 17 August 2021.

Groundwater

2. Please see attached letter from project hydrogeologist, Bay Geological Services Limited, which directly responds to this request.
3. Please see attached letter from Bay Geological Services Limited which directly responds to this request.

Earthworks

4. Please see attached information from the Head of Construction for the proposed golf course. This includes information on the management of earthworks to ensure the construction works are phased and managed in a way that will reduce the potential for windblown erosion and will protect the values of the identified and potential natural wetlands.

   Progressive stabilisation of the works will be employed to 'lock down' the desired landforms immediately on completion of the recontouring. This approach is primarily used to secure the landform sought for the golf course but will also ensure the sandy soils are not lost to windblown erosion.

   As stated in the attached information:

   Open areas in the constructed golf corridor can be broadly broken into four categories:
   1. *Areas being stripped and cleaned in preparation for shaping – potentially exposed to erosion (generally <2Ha)*
   2. *Areas with shaping recently completed and being prepared for seeding – potentially exposed to erosion (generally <1/2Ha)*
   3. *Areas with irrigation installed and operational, seeded and hydro mulched and headed to germination – not erodible (generally <1Ha)*
   4. *Areas with grass germinated and heading towards first mow – not erodible (generally <2Ha)*

   No more than ~2ha of the property will be open at any one time.

20 ADDINGTON ROAD
RD1 OTAKI 5581, NEW ZEALAND
TEL 06 364 7293
WWW.LANDMATTERSNZ.COM

Ecological matters

5. Please see attached memorandum from project ecologists Boffa Miskell which provides an ecological perspective to this request. The golf course design elements have been addressed by the Course Architect (Darius Oliver) in the attached letter.

   In addition to the ecological perspective attached, it should be noted that the course design has been an iterative and constraints/opportunities led process with significant input from technical experts, including Dr Boffa (for landscape and natural character) and Jim Dahm (from a coastal geomorphological perspective). This has resulted in a number of changes to the course design to date, as shown in the attached Land Matters drawing '*Course Layout Iterations*' (ref. 709-LAYOUT-CH), and described in the table below.

Change	Reason/description
A	Hole and fairway redesigned to avoid a natural wetland identified by Boffa Miskell.
B	Fairway and tee rerouting to avoid removal of stand of kanuka. The course layout and design was amended as a result of input from Jim Dahm and Boffa Miskell.
C	Area C was removed from proposed Fairway 3 and Hole 3 for the same reasons as 'B' above. The hole was also relocated to better provide public access to the coastal margin.
D	The fairways for Fairways 4 and 17 were narrowed at the request of Dr Boffa. His reasons for requesting this were natural character related.
E	The hole and fairway for Hole 14 was amended at the recommendation of Dr Boffa. The hole is now in a location where weed species can be removed.

   As shown, the consideration of alternatives has been at the forefront of the design iteration process throughout and has resulted in a development proposal that has been very cognisant of the valued features on the property, including Schedule F habitat, and has protected those features.

   We note that the Fourth Schedule to the RMA requires an assessment of possible alternative locations for the activities where there will be significant adverse effects. In this case the technical documentation does not conclude there will be significant adverse effects. The various reports conclude the effects on the Schedule F habitats will be less than minor. Boffa Miskell, Darius Oliver and Brendon Allen (in the attached letters) note the positive aspects in comparison.

6. Please see attached letter from Boffa Miskell Limited which directly responds to this request.
7. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.
8. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.
9. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.
10. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.
11. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.

12. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request. Although Boffa Miskell note the proposed planting far exceeds a normal 'offsetting' model, we have discussed in the past with Horizons staff (Sara Westcott and Lizzie Daly) the Applicant's willingness to provide detailed planting plans before undertaking the management plan activities on the ground. The Applicant reasserts their willingness for this and would be happy to work with Horizons on a proposed condition of consent to that effect.
13. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.
14. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.
15. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.
16. As above, please see attached letter from Boffa Miskell Limited which directly responds to this request.

Potential additional consent requirements

17. Whilst the information provided to us by the Head of Construction for the golf course confirms the change in soil types on the property will have no effect on the hydrological regime of any natural wetland on the property (or elsewhere in the vicinity of the property) out of an abundance of caution please accept this letter as confirmation that the Applicant also seeks consent, as a **non-complying activity** under Clause 52(1)(a) of the *Resource Management (National Environmental Standards for Freshwater) Regulations 2020*.

    An assessment of the effects of the proposed activity and against the relevant objectives and policies of the *National Policy Statement for Freshwater Management 2020* (**NPS-FM**) is attached to this letter. As it has been demonstrated that the effects of the proposed activity are less than minor and the proposed activity is not contrary to the objectives and policies of the NPS-FM, the proposed activity can be granted consent in accordance with Section 104D of the RMA.
18. As above, the information provided to us by the Head of Construction for the golf course confirms the rate of irrigation proposed will not exceed the rate of uptake by the golf course vegetation surrounding the irrigation source. The intent here is to conserve water as much as possible so any irrigation will not result in discharge of water beyond the immediate area and will not result in ingress of additional water into any identified or potential wetland. However, as some irrigation activity will occur within 100m of an identified or potential wetland, please accept this letter as confirmation that the Applicant also seeks consent, as a **non-complying activity** under Clause 54(c) of the *Resource Management (National Environmental Standards for Freshwater) Regulations 2020*.

    An assessment of the effects of the proposed activity and against the relevant objectives and policies of the NPS-FM is attached to this letter. As it has been demonstrated that the effects of the proposed activity are less than minor and the proposed activity is not contrary to the objectives and policies of the NPS-FM, the proposed activity can be granted consent in accordance with Section 104D of the RMA.

We trust HRC now has all the necessary information to process and determine this application.

Yours sincerely
LAND MATTERS LIMITED

Tom Bland
Senior Resource Management Consultant
Tel: 021 877 894
Email: tom@landmatters.nz

ENGINEERING REPORT - Resource Consent
765 MUHUNOA WEST ROAD
ŌHAU

CLIENT **GRENADIER LIMITED** - September 2021, Revision 2

www.landmatters.nz

DELIVERING INNOVATIVE PROPERTY, COMMUNITY AND ENVIRONMENTAL SOLUTIONS

ENGINEERING REPORT FOR: Grenadier Limited

Reviewed by:

Bryce Holmes
Principal Planner and Director

Prepared by:

Dan Turner
Senior Civil Engineer, BEng Hons

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1. Background & Introduction

Grenadier Ltd are applying for a resource consent to construct an 18-hole golf course, Clubhouse, 20 Accommodation Units, Stables, two Maintenance Sheds and a dwelling with a sleep out (Owner's Cottage) at 765 Muhunoa West Road, Ōhau. The resource consent also includes constructing new accesses, a new vehicle crossing, a car park and extracting groundwater for potable water supply and irrigation.

This report considers the engineering feasibility of constructing a golf course and associated infrastructure. The report addresses the following:

- On-site stormwater attenuation and soakage disposal
- On-site sanitary sewer treatment and disposal
- Water supply, storage and treatment
- Building foundations
- Utility supply
- Access and car park design
- Earthworks
- Firefighting water supply

2. The Property

The property at 765 Muhunoa West Road, Ōhau is zoned rural. The property is located just back from the beach and is located on flat to rolling sand dunes. There is one existing dwelling (semi-permanent caravan). The property is mostly covered in pasture with some areas of mature trees.

***Figure 1** – 765 Muhunoa West Road, Ōhau. (outlined in yellow)*

3. The current situation – Base Engineering Information

3.1. Geology and Soils

The soils are mapped as sandy raw and sandy recent. The geology in this area is mapped as aeolian sand dunes. There is a thin topsoil layer on top of the sand supporting pasture.

Refer Appendix C for test pit logs.

3.2. Three Waters

There are no HDC potable water, sanitary sewer or stormwater services available on Muhunoa West Road.

3.3. Utility Services

This section outlines the existing utility services provided on Muhunoa West Road.

3.3.1. Power

Overhead power lines are located on the northern side Muhunoa West Road and terminate outside the entrance to the property. Underground distribution lines extend from the last pole to the Ōhau Sands subdivision at 762 Muhunoa West Road.

3.3.2. Telecommunications

The Chorus telecommunication network extends down the southern side of Muhunoa West Road and terminates just prior to the property.

3.3.3. Gas

There are no existing gas lines at the western end of Muhunoa West Road.

3.4. Vehicle Access

The property is accessed via a farm gate at the north eastern corner of the property. There are two formed accesses through the property. One access follows the eastern property boundary and the other cuts through the centre of the property to the existing dwelling. In the south west corner of the property there is a vehicle access to the Ōhau River mouth.

4. Engineering Assessment

This section describes how the three waters, utilities, roading and earthworks can be implemented for the Golf Course, Clubhouse, Accommodation Units, Stables, Maintenance Sheds and Owner's Cottage. The objective is to show that a Golf Course and associated infrastructure is feasible at this location.

This report is intended to be referenced in support of a resource consent application. Once the resource consent has been granted a detailed design process will be undertaken for the access, earthworks, three waters and utility connections.

Site investigations were undertaken throughout the property to inform the engineering concept solutions discussed below. The location and type of tests can be found in the engineering drawings in Appendix A.

4.1. Water use assumptions

Refer Figure 2 below for indicative building locations. To calculate the potable water requirement and sanitary sewer disposal the following water use values have been adopted:

- The Clubhouse kitchen will cater for 100 people / day each using 30 liters / day
- The Clubhouse will have 8 staff each using 30 litres per day
- Ten two-bedroom Accommodation Units 40 people / day using 190 litres / day. This is based on an average use of 220 litres / day minus 30 litres / day for the kitchen use, see above
- The Driving Range has two bathrooms. Assume 50 people / day using 10 litres / day

- Owner's Cottage and sleepout houses 8 people using 145 litres / day
- The stable is assumed to use 100 litres / day (domestic) and 300 litres / day for the wash down facility
- The two Maintenance block buildings near the Stables are assumed to use 2,000 litres / day with a toilet and wash down facilities.

Figure 2 *– Plan showing golf course buildings*

4.2. Potable Water

There is no existing water supply on Muhunoa West Road. Potable water will be provided by bore water and roof collection. This section outlines the potable water supply, quality and storage for the golf course buildings and Owner's Cottage.

4.2.1. Supply

4.2.1.a. Clubhouse, Accommodation and Driving Range

Potable water for the Clubhouse, Accommodation Units and Driving Range will be supplied from a shallow (approximately 10m depth) bore. The bore water will be pumped to a series of potable water storage tanks. Refer accompanying drilling report and hydrogeology reports for further details on bore water supply.

The indicative location of the potable water bore is shown on the drawings in Appendix A. Refer sections below for potable water quality and storage considerations.

4.2.1.b. Owner's Cottage and Stables

The Owner's Cottage potable water supply will be provided from captured roof rainwater. The approximate roof area of the cottage and sleepout is 360m^2 and the average annual rainfall is approximately 1,100mm. The average amount of water captured each year is 322m^3. It is assumed that there will be 8 occupants in the dwelling each using 145 litres / person / day. This water use rate is from Table 3.2 in Horizons Manual for On-site Wastewater Systems Design and Management (MOWSDM). Based on these figures the average yearly water use for the cottage will be 440m^3. As there is a net deficit the potable water tanks will need to be topped up during the year.

The 145 litres / person / day is based on a household with 6/3 flush toilets, aerator faucets, shower flow restrictors, water conserving automatic washing machines and dishwasher and no garbage grinder.

The Stables will capture water from the roof to supply water to the toilets and wash facilities. The expected water use for the Stables is 400 litres / day split between 100 litres / day for domestic supply and 300 litres / day for the horse wash down facility.

The roof has an approximate area of 215m^2. Based on these figures and expected rainfall the yearly volumes of captured rainfall and potable water use are 240m^3 and 183m^3 respectively.

4.2.1.c. Maintenance Sheds

The Maintenance Sheds will also capture water from the roof to supply toilets, wash facilities, office and staff room. The expected water use is 2,000 litres / day. The combined area of the two Maintenance Sheds is 900m^2. Based on these figures and expected rainfall the yearly volumes of captured rainfall and potable water use are 990m^3 and 730m^3 respectively.

Refer sections below for potable water quality and storage considerations. Refer flow routing analysis in Appendix B.

4.2.2. Quality

4.2.2.a. Clubhouse, Accommodation and Driving Range

The shallow water bore will supply potable water to the Clubhouse, Accommodation Units and Driving Range.

The bore water supply is classed as a small water supply under section 69G of the Health Act 1956. To be a compliant small water supplier the golf course owner will need to meet the following requirements from section 10 of the Drinking-Water Standards for New Zealand 2005 (DWSNZ) (revised 2018):

- A drinking-water assessor (DWA) must have approved a water safety plan, and the supplier must be implementing the plan
- Appropriate bacterial, protozoal and chemical treatment, as determined from the catchment assessment in the water safety plan, must be in use
- Water suppliers must monitor water quality and ensure it meets the requirements of section 10.4
- Water suppliers must undertake the remedial actions that have been specified in the water safety plan when a maximum acceptable value (MAV) is exceeded, or treatment process controls are not met.

The potable water will be treated as per DWSNZ guidelines. During detailed design the appropriate treatment will be determined and the appropriate water treatment infrastructure selected. A water safety plan will be submitted outlining the proposed water treatment system to be installed. The plan will also outline how the water quality will be monitored.

4.2.2.b. Owner's Cottage, Stables and Maintenance Sheds

Potable water for the Owner's Cottage, Stables and Maintenance Sheds will be provided from rainwater tanks that capture water from the roof. Each building will have a dedicated rainwater tank. As the potable water supplied to each building is to less than 101 people the water supplier is not considered a small water supplier and does not need to comply with DWSNZ.

However, rainwater supplies are known to contain bacteria, protozoal and particulate matter. DWSNZ section 10.3.2.1 *Rainwater supplies* suggest appropriate treatments for these contaminants. It is recommended that an appropriate treatment system be used for the potable water supply for these buildings.

4.2.3. Storage

4.2.3.a. Clubhouse, Accommodation and Driving Range

Potable water supplied by the shallow bore for the Clubhouse, Accommodation Units and Driving Range building will be stored in multiple tanks located to the east of the Accommodation Units.

The estimated water use for the Clubhouse, Accommodation Units and Driving Range shed is 11.3m^3 per day. For resilience it is recommended to store enough potable water for 4 days if the bore needs servicing. This requires a total storage of 45.36m^3. Two 25,000 litre tanks will be sufficient for the potable water supply for these buildings. Two 25,000 litre firefighting water tanks will sit adjacent to the potable water tanks at this location. This provides the minimum 45,000 of firefighting water storage within 90m of the Clubhouse, Accommodation Units and Driving Range, see firefighting section below for further details.

4.2.3.b. Owner's Cottage, Stables and Maintenance Sheds

Potable water for the Owner's Cottage will be captured from the roof. HDC Subdivision and Development Principles and Requirements 2014 (SDPR), Section 12.4 states that the minimum potable water storage is 25,000 litres. It is recommended that the Owner's Cottage potable water supply be stored in two 25,000 litre rain tanks. Refer section 4.4 for more rain tank details.

It is estimated that the horse Stables will require 400 litres / day. The roof area of the Stables is 216m^2. The yearly rainfall capture and yearly use are 193.2m^3 and 189.9m^3 respectively. It is recommended that a 25,000 litre tank be used to store potable water for the Stables.

Rainfall from the two Maintenance Sheds will be stored in rain tanks, one for each building. The roof area of the Sheds are 360m^2 and 540m^2. It is estimated that the smaller Maintenance shed will use 800 litres / day and the larger shed 1,200 litres / day. The yearly rainfall capture and yearly use for the small shed are 322.0m^3 and 292.0m^3 respectively. The yearly rainfall capture and yearly use for the large shed are 483.0m^3 and 438.0m^3 respectively. It is recommended to have two 25,000 litre tanks for potable water storage for each shed.

4.3. Irrigation

Water supply for green and fairway irrigation will be provided from a deep bore, refer to the drilling and hydrogeology reports. Water will be direct pumped from the well or into storage tanks. A shallow underground pipe network will distribute the water down each fairway and onto the greens. Automatic sprinkler heads will be installed to spray water in the specific locations required.

An irrigation network design will be developed during detailed design. A concept irrigation network is shown on the drawings in Appendix A.

4.4. Stormwater Disposal

4.4.1. Buildings

Stormwater captured from the roofs of the Clubhouse and Accommodation Units will be captured and conveyed to storage tanks. This water will be used for irrigation purposes.

Percolation tests were undertaken in several locations across the site. The percolation rates were high due to the sandy soils. On average a soak rate with a factor of safety of 4 applied was 400mm/hr. The Driving Range building will capture rain from the roof and convey this to a small soak pit.

Stormwater captured from the roofs of the Owner's Cottage, Stables and two Maintenance Sheds will be captured and attenuated in rain tanks. A small orifice located near the top of the water storage tanks throttles stormwater flow to be lower than predevelopment flows. See potable water calculations for rain tank sizing and see Appendix B for raintank calculations.

The rain tanks for the Stables and Maintenance Sheds attenuate stormwater flows and capture rain for reuse as potable water in the buildings. The raintank for the Owner's Cottage attenuates stormwater, stores potable water and stores firefighting water supply.

Overflow pipes at the top of the rain tanks allow the release of water in larger stormwater events. This water can be discharged to land or to small soak pits.

During detailed design the rain tanks and soakage pits will be sized.

4.4.2. Accesses

Stormwater from sealed accesses will be captured in swales that will convey the water to soak pits at regular intervals. Sealed car parks will capture water in sumps that will discharge to soak pits. Swale and soak pit sizing will be determined during detailed design.

Unsealed accesses will not require stormwater capture.

4.5. Sanitary Sewer Disposal

There is no existing sanitary sewer network on Muhunoa West Road. It is recommended that wastewater be treated and disposed on site as discussed below. Once treated the wastewater will be discharged to ground via a pressure compensating drip irrigation (PCDI) system. A PCDI requires a minimum secondary treated effluent of BOD_5 and TSS better than 20mg / litre and 30 mg / litre respectively.

The soil logs excavated around the site showed a thin layer of topsoil over the top of sand. A soil category of 1 as per Table 7.3, Appendix B, Onsite Wastewater Management in the Auckland Region has been adopted for this resource consent. Due to the fast drainage characteristics of sand, nutrient leaching may occur and contamination of groundwater may occur. Additional treatment or special design of the land application system will be required during the detailed design stage. A minimum 150mm topsoil is

required for these systems in category 1 soils. The location of disposal fields have been selected to ensure adequate clearance from the Ōhau River.

We are also mindful that iwi are interested in the disposal of wastewater and therefore the disposal fields will be in areas away from the river and integrated with ecological design.

The loading rate for a soil category 1 using a PCDI is 5mm / day as per Table 6.2 in Horizons Regional Council Manual for On-Site Wastewater Systems Design and Management (OSWSDM).

Refer Appendix F for wastewater calculations.

4.5.1. Clubhouse, Accommodation and Driving Range

The grey and black water from the Clubhouse, Accommodation Units and Driving Range building will all be gravity piped to one sewage treatment plant. It is expected that the combined flow rate from these buildings is 11,000 litres / day. Secondary treatment is required for a pressure compensating drip irrigation (PCDI) system. A Hynds Oxyfix FIXEUC90 accepts up to 14,850 litres / day. The purification performance of this treatment plant is 20mg / litre for BOD_5 and 30 mg / litre for TSS, which is compliant with OSWSDM. It is recommended to use a treatment plant like this for these buildings. Refer Appendix E for the Hynds Oxyfix information sheet.

The Clubhouse will have a commercial kitchen. Grease traps should be installed to remove grease from the sanitary sewer water from the kitchen.

Based on an areal loading rate of 5mm / day for category 1 soils and an output of 11,000 litres / day the drip field would need to be 2,200m^2 with a reserve area of 1,100m^2, as per OSWSDM Table 2.3. The drip field is shown on the drawings in Appendix A.

4.5.2. Owner's Cottage, Sleepout and Stables

The Owner's Cottage, Sleepout and Stables domestic wastewater will have a secondary treatment sewer system with a PCDI. Based on an areal loading of 5mm/ day and a daily output of 1,260 litres / day the drip field would need to be 260m^2 with a reserve area of 130m^2.

The wastewater from the horse wash down facility will be treated separately. Wastewater from horse wash down facilities typically contain hair, urine, sweat, manure, dirt, wood waste and straw. Of particular concern is the horsehair, which can clog up the wastewater treatment system if not removed. The wastewater can be conveyed through a grit interceptor before being treated in a wastewater system. The wastewater system will be confirmed at detailed design stage.

4.5.3. Maintenance Sheds

Sanitary sewer from the Maintenance Sheds will be piped into a secondary treatment system. The expected sanitary sewer output from the Maintenance Sheds is 2,000 litres / day. Based on the inflow rate of 2,000 litres / day and an areal loading of 5 mm /day the drip field would need to be 400m^2 with a reserve area of 200m^2.

4.6. Firefighting Supply

The firefighting water supply must comply with New Zealand Fire Service Firefighting Water Supplies Code of Practice, SNZ PAS 4509:2008. It is recommended that all buildings at the golf course have a sprinkler system installed as the site is more than 10 minutes from the nearest fire station and is rural.

Firefighting connection kits will be required at the base of all firefighting water storage tanks and an appropriate access and hard stand area required as per SNZ PAS 4509:2008.

4.6.1. Clubhouse, Accommodation and Driving Range

If the Clubhouse, Accommodation Units and Driving Range building have sprinklers installed these buildings will have a water supply classification of FW2. For a non-reticulated water supply a dedicated firefighting water storage facility holding 45m^3 is required within 90m of these buildings. The requirement for firefighting water storage can be removed if the water bore can provide a flow rate of 12.5 litres / sec within a distance of 135m from the building for a minimum firefighting time of 30 minutes.

Two 25,000 litre tanks will be located adjacent to the potable water tanks for the Clubhouse, Accommodation Units and Driving Range. This location is within 90m of all buildings.

If the Clubhouse does not have a sprinkler system installed the water supply classification changes to FW3 and the required firefighting storage capacity increases from 45,000 litres to 180,000 litres.

4.6.2. Owner's Cottage, Sleepout and Stables

A sprinklered single family home has a water supply classification of FW1. The required firefighting water storage is 7,000 litres. If the home does not have a sprinkler system the water supply classification increases to FW2 and the storage requirement increases to 45,000 litres.

If the Stables has a sprinkler system installed the water supply classification is FW2. The minimum water storage required within 90m of the Stables is 45,000 litres. It is recommended to have one 45,000 litre firefighting storage source for both the Owner's Cottage and Stables as these buildings are within 90m of each other.

Note, if the Stables does not have sprinklers installed then the water supply classification changes to FW3 and the water storage requirement increases to 60,000 litres within 90m.

4.6.3. Maintenance Sheds

If the Maintenance Sheds have sprinkler systems installed the water supply classification is FW2. The minimum water storage required within 90m of the Maintenance Sheds is 45,000 litres.

Note if the Maintenance Sheds do not have sprinklers installed then the water supply classification changes to FW7 and a special assessment is required to calculate the water storage requirements. The FW7 classification is due to the likely bulk storage of fuels.

4.7. Utilities

4.7.1. Power

Overhead power lines are located on the northern side Muhunoa West Road and terminate outside the entrance to the property. The buildings can be supplied from these existing overhead lines.

4.7.2. Telecommunications

The Chorus telecommunication network extends down the southern side of Muhunoa West Road and terminates just prior to the property. This existing network could be used to service the new golf course buildings. Satellite internet is available country wide and would provide faster internet speeds.

4.7.3. Gas

There is no existing gas supply at this end of Muhunoa West Road. No gas connections are proposed for the Gold Course.

4.8. Roading & Transportation

4.8.1. Vehicle Crossing to Muhunoa West Road

Tim Kelly Transportation Planning Limited has assessed the external transportation aspects. This report covers internal layout matters only. There is an existing vehicle crossing to Muhunoa West Road in the north east corner of the property. This access will be retained and used as the main access to the Golf Course. The vehicle access will comply with HDC Engineering Appendix One, Vehicle Crossings, Drawing 6 Rural Crossings.

4.8.2. Access

4.8.2.a. Clubhouse, Accommodation Units and Driving Range

The access to the Clubhouse, Accommodation Units and Driving Range will be formed with a minimum carriageway width of 5.5 to 5.7m, with 0.5m sealed shoulders on both sides as per NZS 4404 Table 3.2, rural access to trade. The total formed width will be 6.5-6.7m. Table 3.2 requires a

pedestrian width of 1.5m on each side of the road. However, this is not considered necessary as it is unlikely that pedestrians will be accessing the golf course from Muhunoa West Road.

Stormwater runoff from the access will be captured in stormwater swales on both sides. The swales will discharge into soak pits at regular intervals along the access.

The access will be two-way from Muhunoa West Road to the Clubhouse. A car park is provided to the south east of the Clubhouse and provides an alternative route to exit the Clubhouse.

Refer Appendix D for access scala results and a concept pavement design for the Clubhouse access.

4.8.2.b. Owner's Cottage, Stables and Maintenance Sheds

The access to the Maintenance Sheds will be formed with a minimum carriageway width of 5.5 to 5.7m, with 0.5m formed shoulders on both sides as per NZS 4404 Table 3.2, rural access to trade. Swales on the side of the access will capture runoff to discharge into soak pits at regular intervals.

The access to the Owner's Cottage and Stables will have a carriageway width of 3.0m inclusive of shoulders as per NZS4404 Table 3.2, rural live and play and will be unsealed. Swales on the side of the access will capture access runoff to discharge into soak pits at regular intervals.

4.8.3. Car Park

The Clubhouse car park has been designed in accordance with AS/NZS 2890.1 and has a one-way aisle. The car park and proposed access to the Clubhouse form a "roundabout" circulating in an anti-clockwise direction. Where the car park exits onto the access, signs and road marking will be provided to indicate that exiting vehicles must give way to vehicles on the access.

The car park provides 61 car parks. All car parks are at 90 degrees. The aisle widths allow for one-way movement. There is one dedicated entry point to the car park and one dedicated exit point from the car park.

The 61 car parks will allow for the following.

- Two car parks for each accommodation unit (20 total)
- 8 staff car parks
- 3 disability car parks as per NZS4121, Table 1
- 25 car parks for the Clubhouse
- 5 car parks for the Driving Range.

The Maintenance Sheds will have staff parking around the outside of the buildings. These will be design in accordance with AS/NZS 2890.1.

4.8.4. Sight Distance

At the location of the vehicle crossing, Muhunoa West Road is straight and flat. The access is located at the end of a no exit road. There is one existing access to the west on the north side of the road to Ōhau Sands subdivision. Sightlines to the west and east along Muhunoa West Road are good and compliant with HDC District Plan Rule 21, Table 21-1.

4.9. Earthworks

Earthworks are required to construct the accesses and car parks. The sand dune that the Clubhouse and Accommodation Units are located will be shaped to provide a flat building platform. The Clubhouse will sit at approximate RL 22.0m and the Accommodation Units will sit at RL 21.0m. The material cut from the dune for the building platforms will be used to fill in areas on the dune. Refer to architectural drawings for plan cut and fill zones and earthworks cross sections.

Some earthworks will be required to shape the fairways and greens, however, the golf course has largely been designed to follow the existing shape of the land.

The total indicative volumes of cut and fill are 118,000m^3 and 83,000m^3 respectively. The total area of earthworks is 114,000m^2. All earthwork volumes are bulk volumes. Refer Appendix A for earthwork

plans.

4.9.1. Erosion and Sediment Controls

During construction erosion and sediment control devices will be installed in accordance with Greater Wellington Regional Council's Erosion and Sediment Control Guidelines. It will be important to stabilize exposed sand faces to prevent wind blown sediment blowing into adjacent properties. Refer Appendix A for the earthworks management plan.

4.10. Venue Foundations

All the proposed buildings within the property will have an importance level of 2 as per NZS3604. Ground investigations as prescribed in NZS3604 Section 3 were undertaken. Based on these investigations and the scala penetrometer results the soil conditions are not classed as good ground. Specific engineering design will be required for all building foundations.

5. Conclusions & Recommendations

Based on the discussions in this report a Golf Course, Clubhouse, Accommodation Units, a Driving Range, a Residential Dwelling, Stables and Maintenance Sheds at 765 Muhunoa West Road is achievable. This report is a preliminary design only and further detailed design will be required.

Overall, we recommend:

1. Potable water for the Clubhouse, Accommodation Units and Driving Range will be sourced from a bore.
2. Potable water for the Owner's Cottage, Stables and Maintenance Sheds will be captured from the roof of each building and stored in rain tanks.
3. Stormwater neutrality is achieved for the Owner's Cottage, Stables and Maintenance Sheds by attenuating the peak discharge in a 10-year, 10-minute duration event by capturing the water from the roof in rain tanks and releasing it slowly through a small orifice.
4. Stormwater from the Clubhouse and Accommodation Units will be piped to storage tanks to be used for irrigation on the golf course.
5. Stormwater from the Driving Range building will be disposed via soakage.
6. Stormwater from accesses will be captured in swales and disposed of in soak pits located at regular intervals.
7. Wastewater from the Clubhouse, Accommodation Units, and Driving Range building will be treated in an on-site secondary treatment plant. The treated effluent will be disposed using a PCDI system.
8. Domestic wastewater from the Owner's Cottage, Sleepout and Stables will be treated in a residential secondary treatment tank and disposed using a PCDI system.
9. Wastewater from the Stables' horse washdown facility will be treated separately from the Stables' domestic wastewater.
10. Wastewater from the Maintenance Sheds will be treated in a secondary treatment plant and disposed of via a PCDI system.
11. Power will be provided by connecting to existing infrastructure on Muhunoa West Road.
12. Telecommunications will be provided by connecting to the existing network on Muhunoa West Road or connecting to satellite internet.
13. The existing access to Muhunoa West Road will be upgraded to a rural vehicle crossing standard.
14. The access to the Clubhouse and the car park will be formed in accordance with NZS4404. The access to the Maintenance Sheds will be formed in all-weather formation. The access to the

Owner's Cottage and Stables will be unsealed.

15. Erosion and sediment controls will be installed in accordance with Greater Wellington Regional Council's Erosion and Sediment Control Guidelines during all land disturbance activities and these will remain in place until all cut faces are stabilized.
16. A dedicated firefighting water source will be required for each building and will be designed in accordance with SNZ PAS 4509:2008. It is recommended that all buildings have sprinklers installed.

APPENDIX A – Drawings

PREPARED BY
LANDMATTERS

CLIENT
GRENADIER LIMITED

PROJECT
DOUGLAS LINKS - OHAU

DRAWING TITLE
OVERALL ENGINEERING PLAN

DATE 02/09/2021
PROJECT NO. 709
SCALE 1:2000 @ A1
1:4000@ A3
DRAWING NO. J709-ENG-130
REV B

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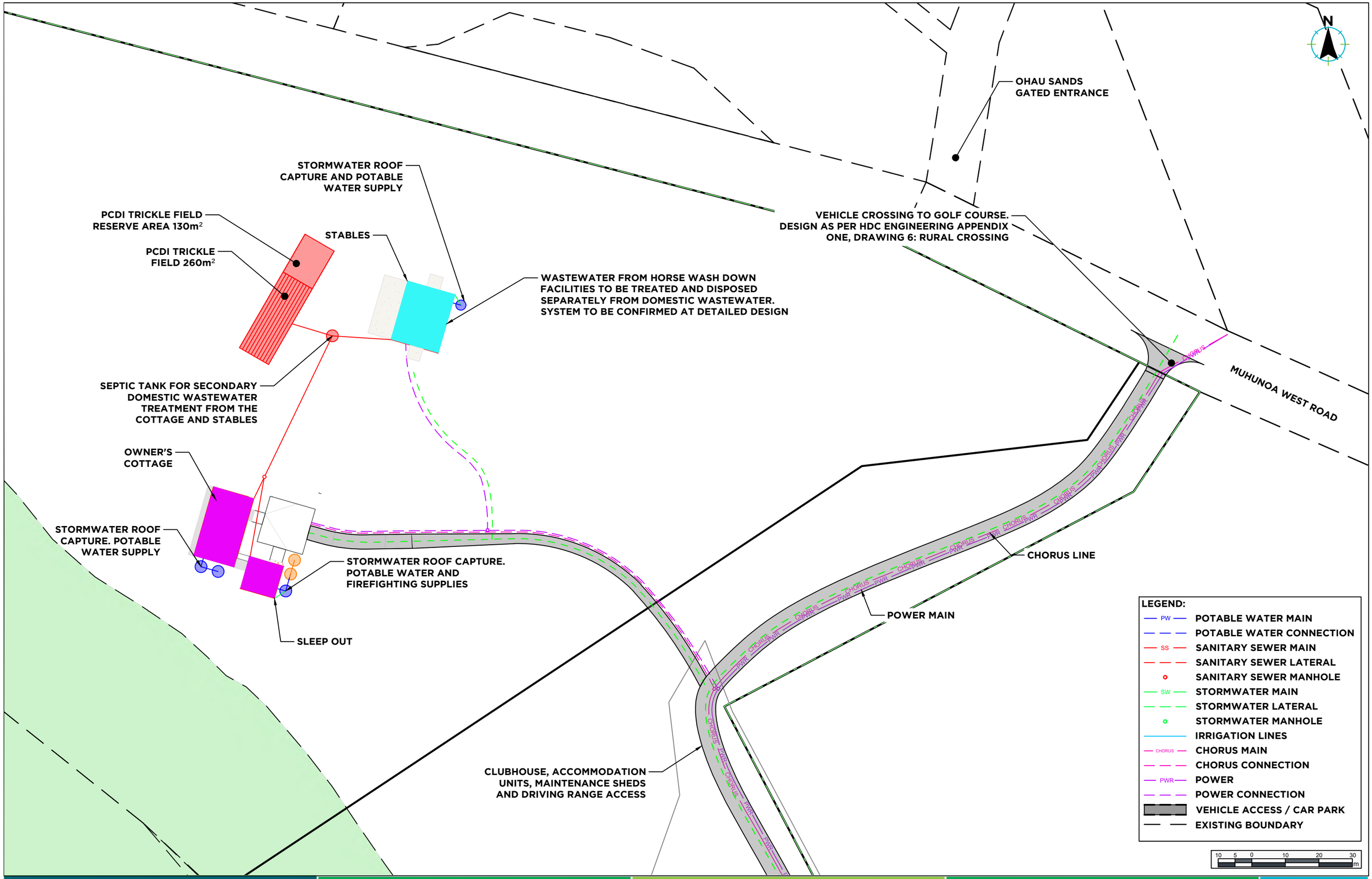

PREPARED BY
LANDMATTERS

CLIENT
GRENADIER LIMITED

PROJECT
DOUGLAS LINKS - OHAU

DRAWING TITLE
ENGINEERING PLAN
STABLES AND OWNER'S COTTAGE

DATE	PROJECT NO.
02/09/2021	709
SCALE	1:500 @ A1 1:1,000 @ A3
DRAWING NO.	REV
J709-ENG-131	B

C:\12d\Data\LM-DATA\709 - Grenadier Developments Limited - Douglas Links - Ohau_78b10 Plans, Aerials, CAD\Plans\ENG For RC - 2021-09-02.dwg, Plotted by Dan Turner at 3/09/2021 10:10:15 am

CLUBHOUSE

DRIVING RANGE ACCESS

CLUBHOUSE, ACCOMMODATION UNITS AND DRIVING RANGE CAR PARK

MAIN VEHICLE ACCESS

POTABLE WATER FOR CLUBHOUSE, ACCOMMODATION UNITS AND DRIVING RANGE STORAGE 2 X 25,000 LITRE TANKS

SOAK PIT FOR ROOF RUNOFF

POTABLE WATER TREATMENT SYSTEM

DRIVING RANGE BUILDING

SEWAGE SECONDARY TREATMENT PLANT

BORE WATER SUPPLY

DRIVING RANGE ACCESS

45,000 LITRE FIREFIGHTING STORAGE TANK FOR SOUTHERN ACCOMMODATION UNITS

STORMWATER MAIN COLLECTING ROOF WATER FROM THE CLUBHOUSE AND ACCOMMODATION UNITS

ACCOMMODATION UNIT ACCESS

ACCOMMODATION UNITS

PCDI TRICKLE FIELD 2,200m²

STORMWATER RUNOFF WATER STORAGE TANKS 4 X 25,000 LITRE TANKS. WATER TO BE USED FOR GOLF COURSE IRRIGATION

PCDI TRICKLE FIELD RESERVE AREA 1,100m²

IRRIGATION LINES

LEGEND:

- PW — POTABLE WATER MAIN
- PW — POTABLE WATER CONNECTION
- SS — SANITARY SEWER MAIN
- SS — SANITARY SEWER LATERAL
- SANITARY SEWER MANHOLE
- SW — STORMWATER MAIN
- SW — STORMWATER LATERAL
- STORMWATER MANHOLE
- IRRIGATION LINES
- CHORUS — CHORUS MAIN
- CHORUS — CHORUS CONNECTION
- PWR — POWER
- POWER CONNECTION
- VEHICLE ACCESS
- GOLF COURSE PROPERTY BDRY
- EXISTING BOUNDARY

10 5 0 10 20 30 m

PREPARED BY LANDMATTERS

CLIENT: GRENADIER LIMITED

PROJECT: DOUGLAS LINKS - OHAU

DRAWING TITLE: ENGINEERING PLAN CLUBHOUSE, ACCOMMODATION UNITS AND DRIVING RANGE

DATE: 21/12/20

PROJECT NO.: 709

SCALE: 1:500 @ A1, 1:1000@ A3

DRAWING NO.: J709-ENG-132

REV: A

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N

DRIVING RANGE

VEHICLE ACCESS TO MAINTENANCE SHEDS

HOLE 6

HOLE 7

HOLE 8

PCDI TRICKLE FIELD 400m²

PCDI TRICKLE FIELD RESERVE AREA 200m²

CHORUS LINE

POWER LINE

SECONDARY WASTEWATER TREATMENT PLANT FOR DOMESTIC WASTEWATER

STORMWATER ROOF CAPTURE AND POTABLE WATER SUPPLY

MAINTENANCE SHEDS

WASTE WATER FROM VEHICLE WASHING AND MAINTENANCE FACILITIES TO BE TREATED VIA AN API SEPARATOR OR SIMILAR APPROVED TO REMOVE MATERIALS NOT SUITABLE FOR THE SECONDARY WASTE WATER TREATMENT PLANT. SEPARATED MATERIAL TO BE REMOVED FROM SITE AND DISPOSED OF APPROPRIATELY

FIREFIGHTING WATER SUPPLY FOR MAINTENANCE SHEDS AND STABLES, 45,000 LITRES

STORMWATER ROOF CAPTURE AND POTABLE WATER SUPPLY

LEGEND:

- PW — POTABLE WATER MAIN
- POTABLE WATER CONNECTION
- SS — SANITARY SEWER MAIN
- SANITARY SEWER LATERAL
- SANITARY SEWER MANHOLE
- SW — STORMWATER MAIN
- STORMWATER LATERAL
- STORMWATER MANHOLE
- IRRIGATION LINES
- CHORUS — CHORUS MAIN
- CHORUS CONNECTION
- PWR — POWER
- POWER CONNECTION
- VEHICLE ACCESS / CAR PARK
- EXISTING BOUNDARY

10 5 0 10 20 30 m

PREPARED BY LANDMATTERS

CLIENT: GRENADIER LIMITED

PROJECT: DOUGLAS LINKS - OHAU

DRAWING TITLE: ENGINEERING PLAN MAINTENANCE SHEDS

DATE	PROJECT NO.
02/09/2021	709
SCALE	1:500 @ A1 1:1,000 @ A3
DRAWING NO.	REV
J709-ENG-133	A

C:\12dSVistaLM-DATA\709 - Grenadier Developments Limited - Douglas Links - Ohau_786\10 Plans, Aerials, CAD\Plans\ENG For RC - 2021-09-02.dwg, Plotted by Dan Turner at 3/09/2021 10:10:25 am

APPENDIX B – Flow Routing Calculations

Rain tank - Flow routing analysis for Owner's Cottage

Determine Temporary Storage Zone Requirements

(A) Site Data			
Soil type:	sand		
Areas:			C Value
Roof and impervious	250	m^2	0.9
Pervious area	250	m^2	0.4
(B) Tank details			
Orifice diameter calculation			
$Q=3.47 \times C_d \times d^2 \times h^{0.5}$			
Tank radius	1.75	m	
Number of tanks	2	ea	
Combined tank area	19.2	m^2	
Depth to overflow	2.50		
Depth to outlet	2.30		
Max head height	0.20	m	
Tank volume	3.85	m^3	
Orifice diam (max), d	0.03	m	
Orifice diam sqared, d^2	0.0009	m^2	
Orficie discharge coef	0.69	Cd	
Orfice area	0.0007	m^2	
Peak flow	1.0	l/s	
(c) Hydrology - by rational method			
Tc	10	min	
Storm duration	10	min	
Rainfall I (10% AEP)	89.44	mm/hr	
	C value	Peak discharge	
Pre development	0.4	2.5	l/s
Post development	0.9	5.6	l/s

		Tank inflow	Tank		Adjusted	Tank		Net device	Site runoff cals	
Time	Tank inflow	volume	Storage	Tank WL	Av WL	Outflow	Outflow vol	Storage	R-o-S	Total
mins	l/s	m^3	m^3	m	m	l/s	m^3	m^3	l/s	l/s
t	A	$B=A_{av}*t$	$C=G_{t-1}+B$	E=C/Area		F	$F*t$	$G=C-F*t$	H	I=F+H
0	0.00	0.00	0	0	0	0	0	0	0.0	0.0
2.5	1.40	0.10	0.105	0.005	0.003	0.112	0.017	0.088	0.0	0.1
5	2.79	0.31	0.402	0.021	0.013	0.247	0.074	0.328	0.0	0.2
7.5	4.19	0.52	0.852	0.044	0.033	0.389	0.175	0.677	0.0	0.4
10	5.59	0.73	1.411	0.073	0.059	0.523	0.314	1.097	0.0	0.5
12.5	4.19	0.73	1.831	0.095	0.084	0.625	0.469	1.362	0.0	0.6
15	2.79	0.52	1.886	0.098	0.097	0.670	0.603	1.283	0.0	0.7
17.5	1.40	0.31	1.598	0.083	0.091	0.648	0.681	0.917	0.0	0.6
20	0.00	0.10	1.022	0.053	0.068	0.562	0.675	0.347	0.0	0.6
22.5	0	0.00	0.347							

Result:		
Tank area	19.2	m^2
Max water level	0.10	m
Orifice diameter	0.03	m
Temp storage req'd, V	1.9	m^3
Temp storage provided	3.8	m^3

Determine Potable Water Storage Zone Requirements

Inputs		
Roof area	360	m^2
No. of people	8	
Per capita use	145	l/p/d
Non summer	1160	l/d
Summer	116	l/d
Total summer	1276	l/d
Target % demand from tank	100	%
Rainfall loss factor	0.8	SDPR

	Ave rainfall	**Inflow**	Days in	Outflow	**Difference**	**Net storage**
	NIWA	**Total**		dwelling		
	(mm)	**m^3**	month	m^3	**m^3**	**m^3**
						8.2
January	76	**21.9**	31	39.6	**-17.7**	**-9.5**
February	77	**22.2**	28	35.7	**-13.6**	**-23.0**
March	93	**26.8**	31	39.6	**-12.8**	**-35.8**
April	96	**27.6**	30	34.8	**-7.2**	**-42.9**
May	112	**32.3**	31	36.0	**-3.7**	**-46.6**
June	106	**30.5**	30	34.8	**-4.3**	**-50.9**
July	98	**28.2**	31	36.0	**-7.7**	**-58.7**
August	100	**28.8**	31	36.0	**-7.2**	**-65.8**
September	93	**26.8**	30	34.8	**-8.0**	**-73.8**
October	99	**28.5**	31	36.0	**-7.4**	**-81.3**
November	90	**25.9**	30	34.8	**-8.9**	**-90.2**
December	78	**22.5**	31	39.6	**-17.1**	**-107.3**
Total	1118	**322.0**	365	437.436		**-9.5**
		Minimum permanent storage required				**-17.7**

Tank sizing

Total storage required, T:		
Temporary storage (attenuation), V	3.8	m^3
Potable water invert height	0.8	m
Permanent storage required, S	-9.5	m^3
Permanent storage provided, S	28.9	m^3
Firefighting outlet invert height	0.1	m
Firefighting storage	13.5	m^3
Dead storage, D	1.9	m^3
Total tank capacity	48.1	m^3

Top overflow pipe diameter, F		
Design discharge, $Q = 0.00028 \times A \times I_2$		
A, roof area	250	m^2
I_2, 2% AEP rainfall for 10min storm	125.28	mm/hr
Design discharge, Q	8.8	l/s
$Q = 3470 \times C_d \times X\ d^2 \times h^{0.5}$		
C_d	0.65	
Head h equals pipe diameter	0.11	m
Solve for d =SQRT ($Q /(3470 \times C_d \times h^{0.5})$)	0.11	m
Difference	0.00	m

Recommend using 2 x 25,000 litre rain tanks			
Devan 25,000 litre rain tank (or similar) design parameters			
Number of tanks	2	no.	
Tank diameter	3.5	m	
Radius	1.75	m	
Base area (total)	19.2	m^2	
Overflow pipe height	2.50	m	
Overflow pipe diam (min.)	0.11	m	
Orifice diameter (max.)	0.030	m	
Orifice height (temp. storage)	2.30	m	
Temporary storage provided	3.8	m^3	
Outlet height (potable water)	0.8	m	
Permanent storage provided	28.9	m^3	25,000 litres minimum water storage requirement as per HDC SDPR, Section 12.4
Fire fighting outlet pipe height	0.1	m	
Firefighting storage	13.5	m^3	7,000 litres for a dwelling with a sprinkler system, 45,000 litres if no sprinkler system
Dead storage at base of tanks	1.9	m^3	
Total of four volumes	48.1	m^3	
Total tank storage	48.1	m^3	

Rain tank - Flow routing analysis for Stables

Determine Temporary Storage Zone Requirements

(A) Site Data			
Soil type:	sand		
Areas:			C Value
Roof and impervious	216	m^2	0.9
Pervious area	216	m^2	0.4
(B) Tank details			
Orifice diameter calculation			
$Q=3.47 \times C_d \times d^2 \times h^{0.5}$			
Tank radius	1.75	m	
Number of tanks	1	ea	
Combined tank area	9.6	m^2	
Depth to overflow	2.50		
Depth to outlet	2.30		
Max head height	0.20	m	
Tank volume	1.92	m^3	
Orifice diam (max), d	0.03	m	
Orifice diam sqared, d^2	0.0009	m^2	
Orficie discharge coef	0.69	Cd	
Orfice area	0.0007	m^2	
Peak flow	1.0	l/s	
(c) Hydrology - by rational method			
Tc	10	min	
Storm duration	10	min	
Rainfall I (10% AEP)	89.44	mm/hr	
	C value	Peak discharge	
Pre development	0.4	2.1	l/s
Post development	0.9	4.8	l/s

		Tank inflow	Tank		Adjusted	Tank		Net device	Site runoff cals	
Time	Tank inflow	volume	Storage	Tank WL	Av WL	Outflow	Outflow vol	Storage	R-o-S	Total
mins	l/s	m^3	m^3	m	m	l/s	m^3	m^3	l/s	l/s
t	A	$B=A_{av}*t$	$C=G_{t-1}+B$	E=C/Area		F	$F*t$	$G=C-F*t$	H	I=F+H
0	0.00	0.00	0	0	0	0	0	0	0.0	0.0
2.5	1.21	0.09	0.091	0.009	0.005	0.148	0.022	0.068	0.0	0.1
5	2.41	0.27	0.340	0.035	0.022	0.322	0.097	0.243	0.0	0.3
7.5	3.62	0.45	0.696	0.072	0.054	0.500	0.225	0.471	0.0	0.5
10	4.83	0.63	1.105	0.115	0.094	0.659	0.396	0.709	0.0	0.7
12.5	3.62	0.63	1.343	0.140	0.127	0.769	0.576	0.767	0.0	0.8
15	2.41	0.45	1.220	0.127	0.133	0.786	0.708	0.512	0.0	0.8
17.5	1.21	0.27	0.783	0.081	0.104	0.695	0.730	0.053	0.0	0.7
20	0.00	0.09	0.144	0.015	0.048	0.473	0.568	-0.424	0.0	0.5
22.5	0	0.00	-0.424							

Result:		
Tank area	9.6	m^2
Max water level	0.14	m
Orifice diameter	0.03	m
Temp storage req'd, V	1.3	m^3
Temp storage provided	1.9	m^3

Determine Potable Water Storage Zone Requirements

Inputs		
Roof area	216	m^2
Water use	400	l/d
Target % demand from tank	100	%
Rainfall loss factor	0.8	SDPR

	Ave rainfall	**Inflow**	Days in	Outflow	**Difference**	**Net storage**
	NIWA	**Total**		stables		
	(mm)	**m^3**	month	m^3	**m^3**	**m^3**
	NIWA					**0.0**
January	76	**13.1**	31	12.4	**0.7**	**0.7**
February	77	**13.3**	28	11.2	**2.1**	**2.8**
March	93	**16.1**	31	12.4	**3.7**	**6.5**
April	96	**16.6**	30	12.0	**4.6**	**11.1**
May	112	**19.4**	31	12.4	**7.0**	**18.1**
June	106	**18.3**	30	12.0	**6.3**	**24.4**
July	98	**16.9**	31	12.4	**4.5**	**28.9**
August	100	**17.3**	31	12.4	**4.9**	**33.8**
September	93	**16.1**	30	12.0	**4.1**	**37.9**
October	99	**17.1**	31	12.4	**4.7**	**42.6**
November	90	**15.6**	30	12.0	**3.6**	**46.1**
December	78	**13.5**	31	12.4	**1.1**	**47.2**
Total	1118	**193.2**	365	146		**0.7**
		Minimum permanent storage required				**0.7**

Tank sizing

Total storage required, T:		
Temporary storage, V	1.9	m^3
Permanent storage required, S	0.7	m^3
Permanent storage provided, S	21.2	m^3
Dead storage, D	1.0	m^3
Total tank storage	24.1	m^3

Top overflow pipe diameter, F		
Design discharge, Q = 0.00028 x A x I_2		
A, roof area	216	m^2
I_2, 2% AEP rainfall for 10min storm	125.28	mm/hr
Design discharge, Q	7.6	l/s
Q = 3470 x C_d x X d^2 x $h^{0.5}$		
C_d	0.65	
Head h equals pipe diameter	0.10	m
Solve for d =SQRT (Q /(3470 xC_dx$h^{0.5}$))	0.10	m
Difference	0.00	m

Recommend using 3 x 25,000 litre rain tanks		
Devan 25,000 litre rain tank (or similar) design parameters		
Number of tanks	1	no.
Tank diameter	3.5	m
Radius	1.75	m
Base area (total)	9.6	m^2
Overflow pipe height	2.50	m
Overflow pipe diam (min.)	0.10	m
Orifice diameter (max.)	0.030	m
Orifice height (temp. storage)	2.30	m
Temporary storage provided	1.9	m^3
Outlet height (potable water)	0.1	m
Permanent storage provided	21.2	m^3
Dead storage at base of tanks	1.0	m^3
Total of three volumes	24.1	m^3
Total tank storage	24.1	m^3

Rain tank - Flow routing analysis for the Small Maintenance Shed

Determine Temporary Storage Zone Requirements

(A) Site Data			
Soil type:	sand		
Areas:			C Value
Roof and impervious	360	m^2	0.9
Pervious area	360	m^2	0.4
(B) Tank details			
Orifice diameter calculation			
$Q=3.47 \times C_d \times d^2 \times h^{0.5}$			
Tank radius	1.75	m	
Number of tanks	2	ea	
Combined tank area	19.2	m^2	
Depth to overflow	2.50		
Depth to outlet	2.20		
Max head height	0.30	m	
Tank volume	5.77	m^3	
Orifice diam (max), d	0.03	m	
Orifice diam sqared, d^2	0.0009	m^2	
Orficie discharge coef	0.69	Cd	
Orfice area	0.0007	m^2	
Peak flow	1.2	l/s	
(c) Hydrology - by rational method			
Tc	10	min	
Storm duration	10	min	
Rainfall I (10% AEP)	89.44	mm/hr	
	C value	Peak discharge	
Pre development	0.4	3.6	l/s
Post development	0.9	8.0	l/s

		Tank inflow	Tank		Adjusted	Tank		Net device	Site runoff cals	
Time	Tank inflow	volume	Storage	Tank WL	Av WL	Outflow	Outflow vol	Storage	R-o-S	Total
mins	l/s	m^3	m^3	m	m	l/s	m^3	m^3	l/s	l/s
t	A	$B=A_{av}*t$	$C=G_{t-1}+B$	E=C/Area		F	$F*t$	$G=C-F*t$	H	I=F+H
0	0.00	0.00	0	0	0	0	0	0	0.0	0.0
2.5	2.01	0.15	0.151	0.008	0.004	0.135	0.020	0.131	0.0	0.1
5	4.02	0.45	0.583	0.030	0.019	0.298	0.089	0.494	0.0	0.3
7.5	6.04	0.75	1.249	0.065	0.048	0.470	0.212	1.037	0.0	0.5
10	8.05	1.06	2.094	0.109	0.087	0.635	0.381	1.713	0.0	0.6
12.5	6.04	1.06	2.769	0.144	0.126	0.766	0.574	2.195	0.0	0.8
15	4.02	0.75	2.949	0.153	0.149	0.831	0.748	2.202	0.0	0.8
17.5	2.01	0.45	2.654	0.138	0.146	0.822	0.863	1.791	0.0	0.8
20	0.00	0.15	1.942	0.101	0.119	0.745	0.894	1.048	0.0	0.7
22.5	0	0.00	1.048							

Result:		
Tank area	19.2	m^2
Max water level	0.15	m
Orifice diameter	0.03	m
Temp storage req'd, V	2.9	m^3
Temp storage provided	5.8	m^3

Determine Potable Water Storage Zone Requirements

Inputs		
Roof area	360	m^2
Water use	800	l/d
Target % demand from tank	100	%
Rainfall loss factor	0.8	SDPR

	Ave rainfall	**Inflow**	Days in	Outflow	**Difference**	**Net storage**
	NIWA	**Total**		main shed		
	(mm)	**m^3**	month	m^3	**m^3**	**m^3**
	NIWA					**0.0**
January	76	**21.9**	31	24.8	**-2.9**	**-2.9**
February	77	**22.2**	28	22.4	**-0.2**	**-3.1**
March	93	**26.8**	31	24.8	**2.0**	**-1.2**
April	96	**27.6**	30	24.0	**3.6**	**2.5**
May	112	**32.3**	31	24.8	**7.5**	**10.0**
June	106	**30.5**	30	24.0	**6.5**	**16.5**
July	98	**28.2**	31	24.8	**3.4**	**19.9**
August	100	**28.8**	31	24.8	**4.0**	**23.9**
September	93	**26.8**	30	24.0	**2.8**	**26.7**
October	99	**28.5**	31	24.8	**3.7**	**30.4**
November	90	**25.9**	30	24.0	**1.9**	**32.3**
December	78	**22.5**	31	24.8	**-2.3**	**30.0**
Total	1118	**322.0**	365	292.0		**32.3**
		Minimum permanent storage required				**32.3**

Tank sizing

Total storage required, T:		
Temporary storage, V	5.8	m^3
Permanent storage required, S	32.3	m^3
Permanent storage provided, S	40.4	m^3
Dead storage, D	1.9	m^3
Total tank storage	48.1	m^3

Top overflow pipe diameter, F		
Design discharge, Q = 0.00028 x A x I_2		
A, roof area	360	m^2
I_2, 2% AEP rainfall for 10min storm	125.28	mm/hr
Design discharge, Q	12.6	l/s
Q = 3470 x C_d x X d^2 x $h^{0.5}$		
C_d	0.65	
Head h equals pipe diameter	0.13	m
Solve for d =SQRT (Q /(3470 xC_dx$h^{0.5}$))	0.13	m
Difference	0.00	m

Recommend using 3 x 25,000 litre rain tanks		
Devan 25,000 litre rain tank (or similar) design parameters		
Number of tanks	2	no.
Tank diameter	3.5	m
Radius	1.75	m
Base area (total)	19.2	m^2
Overflow pipe height	2.50	m
Overflow pipe diam (min.)	0.13	m
Orifice diameter (max.)	0.030	m
Orifice height (temp. storage)	2.20	m
Temporary storage provided	5.8	m^3
Outlet height (potable water)	0.1	m
Permanent storage provided	40.4	m^3
Dead storage at base of tanks	1.9	m^3
Total of three volumes	48.1	m^3
Total tank storage	48.1	m^3

Rain tank - Flow routing analysis for the Large Maintenance Shed

Determine Temporary Storage Zone Requirements

(A) Site Data			
Soil type:	sand		
Areas:			C Value
Roof and impervious	540	m^2	0.9
Pervious area	540	m^2	0.4
(B) Tank details			
Orifice diameter calculation			
$Q=3.47 \times C_d \times d^2 \times h^{0.5}$			
Tank radius	1.75	m	
Number of tanks	2	ea	
Combined tank area	19.2	m^2	
Depth to overflow	2.50		
Depth to outlet	2.20		
Max head height	0.30	m	
Tank volume	5.77	m^3	
Orifice diam (max), d	0.03	m	
Orifice diam sqared, d^2	0.0009	m^2	
Orficie discharge coef	0.69	Cd	
Orfice area	0.0007	m^2	
Peak flow	1.2	l/s	
(c) Hydrology - by rational method			
Tc	10	min	
Storm duration	10	min	
Rainfall I (10% AEP)	89.44	mm/hr	
	C value	Peak discharge	
Pre development	0.4	5.4	l/s
Post development	0.9	12.1	l/s

		Tank inflow	Tank		Adjusted	Tank		Net device	Site runoff cals	
Time	Tank inflow	volume	Storage	Tank WL	Av WL	Outflow	Outflow vol	Storage	R-o-S	Total
mins	l/s	m^3	m^3	m	m	l/s	m^3	m^3	l/s	l/s
t	A	$B=A_{av}*t$	$C=G_{t-1}+B$	E=C/Area		F	$F*t$	$G=C-F*t$	H	I=F+H
0	0.00	0.00	0	0	0	0	0	0	0.0	0.0
2.5	3.02	0.23	0.226	0.012	0.006	0.165	0.025	0.202	0.0	0.2
5	6.04	0.68	0.881	0.046	0.029	0.365	0.110	0.771	0.0	0.4
7.5	9.06	1.13	1.903	0.099	0.072	0.580	0.261	1.642	0.0	0.6
10	12.07	1.58	3.227	0.168	0.133	0.787	0.472	2.755	0.0	0.8
12.5	9.06	1.58	4.340	0.226	0.197	0.955	0.717	3.623	0.0	1.0
15	6.04	1.13	4.755	0.247	0.236	1.048	0.943	3.812	0.0	1.0
17.5	3.02	0.68	4.491	0.233	0.240	1.056	1.109	3.382	0.0	1.1
20	0.00	0.23	3.609	0.188	0.210	0.989	1.186	2.422	0.0	1.0
22.5	0	0.00	2.422							

Result:		
Tank area	19.2	m^2
Max water level	0.25	m
Orifice diameter	0.03	m
Temp storage req'd, V	4.8	m^3
Temp storage provided	5.8	m^3

Determine Potable Water Storage Zone Requirements

Inputs		
Roof area	540	m^2
Water use	1200	l/d
Target % demand from tank	100	%
Rainfall loss factor	0.8	SDPR

	Ave rainfall	**Inflow**	Days in	Outflow	**Difference**	**Net storage**
	NIWA	**Total**		main shed		
	(mm)	**m^3**	month	m^3	**m^3**	**m^3**
	NIWA					**0.0**
January	76	**32.8**	31	37.2	**-4.4**	**-4.4**
February	77	**33.3**	28	33.6	**-0.3**	**-4.7**
March	93	**40.2**	31	37.2	**3.0**	**-1.7**
April	96	**41.5**	30	36.0	**5.5**	**3.7**
May	112	**48.4**	31	37.2	**11.2**	**14.9**
June	106	**45.8**	30	36.0	**9.8**	**24.7**
July	98	**42.3**	31	37.2	**5.1**	**29.9**
August	100	**43.2**	31	37.2	**6.0**	**35.9**
September	93	**40.2**	30	36.0	**4.2**	**40.0**
October	99	**42.8**	31	37.2	**5.6**	**45.6**
November	90	**38.9**	30	36.0	**2.9**	**48.5**
December	78	**33.7**	31	37.2	**-3.5**	**45.0**
Total	1118	**483.0**	365	438.0		**48.5**
		Minimum permanent storage required				**48.5**

Tank sizing

Total storage required, T:		
Temporary storage, V	5.8	m^3
Permanent storage required, S	48.5	m^3
Permanent storage provided, S	40.4	m^3
Dead storage, D	1.9	m^3
Total tank storage	48.1	m^3

Some water will be released to ground during the wetter months.

Top overflow pipe diameter, F		
Design discharge, Q = 0.00028 x A x I_2		
A, roof area	540	m^2
I_2, 2% AEP rainfall for 10min storm	125.28	mm/hr
Design discharge, Q	18.9	l/s
Q = 3470 x C_d x X d^2 x $h^{0.5}$		
C_d	0.65	
Head h equals pipe diameter	0.15	m
Solve for d =SQRT (Q /(3470 xC_dx$h^{0.5}$))	0.15	m
Difference	0.00	m

Recommend using 3 x 25,000 litre rain tanks		
Devan 25,000 litre rain tank (or similar) design parameters		
Number of tanks	2	no.
Tank diameter	3.5	m
Radius	1.75	m
Base area (total)	19.2	m^2
Overflow pipe height	2.50	m
Overflow pipe diam (min.)	0.15	m
Orifice diameter (max.)	0.030	m
Orifice height (temp. storage)	2.20	m
Temporary storage provided	5.8	m^3
Outlet height (potable water)	0.1	m
Permanent storage provided	40.4	m^3
Dead storage at base of tanks	1.9	m^3
Total of three volumes	48.1	m^3
Total tank storage	48.1	m^3

APPENDIX C – Test Pit Logs

LANDMATTERS

LOG OF TEST PIT TP01
Existing access near gate to Muhunoa West Road
Geotechnical investigations

765 Muhunoa West Road, Ohau

Client: Grenadier Developments
Date: 24/11/2020
Digger type / size: N/A
Location: Near entrance

Logged by: DT SN
Auger size: 100mm
Existing ground level: 8.0m RL
Max test pit depth: 0.9m

Depth (m)	Material	Excavatability (Relative scale) Easier–Harder	USCS Symbol	Description	Graphic symbol	Water Level	Moisture Cond.	Consistency / Density Index	Scala Penetrometer Blows per 100mm (2 4 6 8 10)
0.25	Sand		SP	Grey Sand		Not encountered	Slightly Moist	Loose	
0.5									
0.75									
				Required depth reached					
1.0									
1.25									
1.5									
1.75									

LANDMATTERS

LOG OF TEST PIT TP02
Maintenance Sheds
Geotechnical investigations

765 Muhunoa West Road, Ohau

Client: Grenadier Developments
Date: 24/11/2020
Digger type / size: N/A
Location: Maintenance sheds

Logged by: DT SN
Auger size: 0.1m
Existing ground level: 11.0m RL
Max test pit depth: 0.875m

Depth (m)	Material	Excavatability (Relative scale) Easier–Harder	USCS Symbol	Description	Graphic symbol	Water Level	Moisture Cond.	Consistency / Density Index	Scala Penetrometer Blows per 100mm (2 4 6 8 10)
0.25	Sand		SP	Grey Sand		Not encountered	Dry / Slightly Moist	Loose	
0.5									
0.75									
1.0									
1.25									
1.5									
1.75									
1.9									

Required depth reached

LANDMATTERS

LOG OF TEST PIT TP03
Owner's Cottage
Geotechnical investigations

765 Muhunoa West Road, Ohau

Client: Grenadier Developments
Date: 24/11/2020
Digger type / size: N/A
Location: Owner's Cottage
Logged by: DT SN
Auger size: 0.1m
Existing ground level: 20.0m RL
Max test pit depth: 1.5m

Depth (m)	Material	Excavatability (Relative scale) Easier–Harder	USCS Symbol	Description	Graphic symbol	Water Level	Moisture Cond.	Consistency / Density Index	Scala Penetrometer Blows per 100mm (2 4 6 8 10)
0.25	Sand		SP	Grey Brown Sand		Not encountered	Dry / Slightly Moist	Loose	
0.5									
0.75									
1.0									
1.25									
1.5									

Required depth reached

LANDMATTERS

LOG OF TEST PIT TP05
Driving range and trickle field
Geotechnical investigations

119 Rangiuru Road,
Otaki Beach

Client: Grenadier Developments
Date: 24/11/2020
Digger type / size: N/A
Location: Driving range

Logged by: DT and SN
Auger size: 0.1m diam
Existing ground level: 7.0m RL
Max test pit depth: 0.9m

Depth (m)	Material	Excavatability (Relative scale) Easier–Harder	USCS Symbol	Description	Graphic symbol	Water Level	Moisture Cond.	Consistency / Density Index	Scala Penetrometer Blows per 100mm (2 4 6 8 10)
0	TS		OL	TOPSOIL, dry, dark brown, rootlets to 50mm		Not encountered	Slightly Moist	Loose	No scalas undertaken
0.25	Sand		SP	Dark brown sand					
0.5									
0.75				Grey sand					
1.0				Orange Sand					
1.25				Grey sand					
1.5				Target depth reached					
1.75									

LANDMATTERS

LOG OF TEST PIT TP06
Existing dwelling
Geotechnical investigations

765 Muhunoa West Road, Ohau

Client: Grenadier Developments
Date: 24/11/2020
Digger type / size: N/A
Location: Existing dwelling

Logged by: DT SN
Auger size: 0.1m
Existing ground level: 21.0m RL
Max test pit depth: 1.4m

Depth (m)	Material	Excavatability (Relative scale) Easier–Harder	USCS Symbol	Description	Graphic symbol	Water Level	Moisture Cond.	Consistency / Density Index	Scala Penetrometer Blows per 100mm (2 4 6 8 10)
0				Orange sands with trace of gravels			Dry		
0.25									
0.5									
0.75	Sand		SP	Grey Sand		Not encountered	Slightly Moist	Loose	
1.0									
1.25									
1.4									

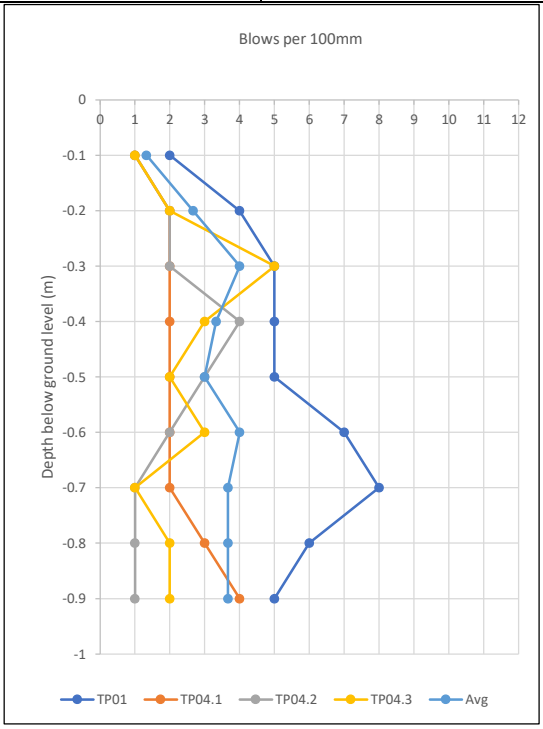
Required depth reached and no change

APPENDIX D – Scala Test Results

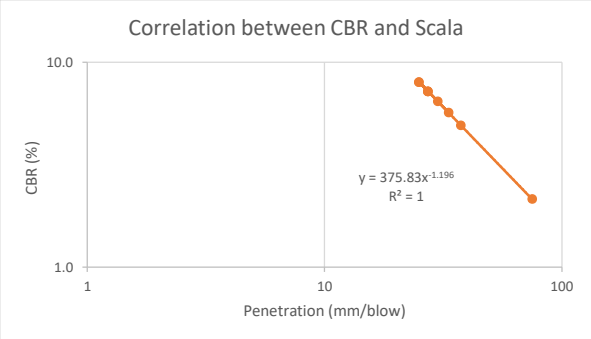
LANDMATTERS

Scala Penetrometer Test Results and Concept Pavement Design for the Clubhouse Access at TP01 and TP04

Client: Grenadier Developments
Logged by: DT SN
Date: 24/11/2020
Existing ground level: 9.0m RL (approx.)
Location: 765 Muhunoa West Road, Ohau
Max test pit depth: 0.9m

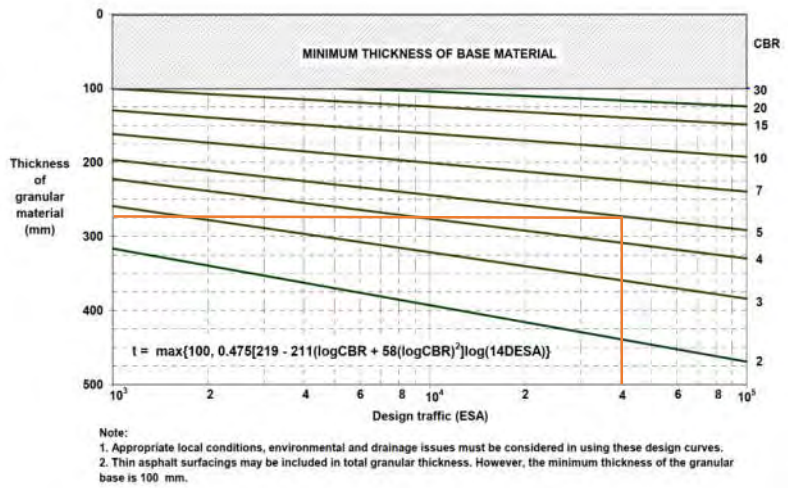


Depth (m)	Blows per 100mm (number) TP01	TP04.1	TP04.2	TP04.3	Ave.	mm/ blow	CBR
0	0	0	0	0	0.0		
-0.1	2	1	1	1	1.3	75	2.1
-0.2	4	2	2	2	2.7	38	4.9
-0.3	5	2	2	5	4.0	25	8.0
-0.4	5	2	4	3	3.3	30	6.4
-0.5	5	2	3	2	3.0	33	5.7
-0.6	7	2	2	3	4.0	25	8.0
-0.7	8	2	1	1	3.7	27	7.2
-0.8	6	3	1	2	3.7	27	7.2
-0.9	5	4	1	2	3.7	27	7.2



In accordance to Austroads:Pavement Design for Light Traffic

5 %	CBR
Steet type:	Local access with no buses
400 v/day	AADT
4 %	Heavy vehicles
8	AADHV (single lane)
20 years	Design period
1 %	Annual growth rate
22	Cumulative growth factor
2.1 no.	Axle groups per heavy vehicle
128,480	Cumulative HVAG
0.3	ESA/HVAG
4 x 10^4 ESA	Indicative design traffic, Pavement Design for Light Traffic, Table 7.9
40,000 ESA	Indicative design traffic
275 mm	Thickness of granular material required, Figure 8.5



Note:
1. Appropriate local conditions, environmental and drainage issues must be considered in using these design curves.
2. Thin asphalt surfacings may be included in total granular thickness. However, the minimum thickness of the granular base is 100 mm.

Figure 8.5: Light traffic design chart for granular pavements with thin bituminous surfacings

APPENDIX E – Wastewater Treatment Plant Example

Product : Sewage treatment plant

Type : Oxyfix® FIXEUC90
Model : 14.85 m³/day - C-90 CB 99 PE (3) Tri 3x400V + N
Process : Submerged Aerated Fixed Film (SAFF) Technology

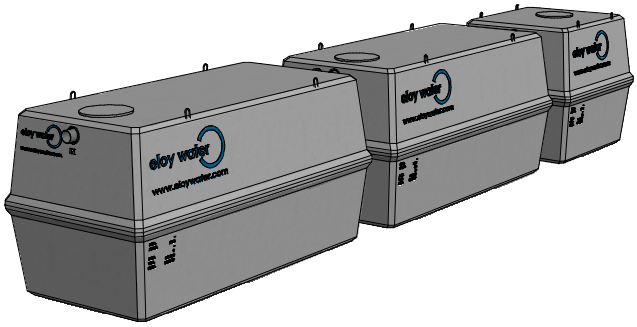
PERFORMANCE

Assumed Influent Values

Application :	Wastewater Treatment*	
Pollutant load BOD_5 :	400	mg/L
Pollutant load TSS :	600	mg/L
Pollutant load Ntot :	80	mg/L
Pollutant load Ptot :	13	mg/L

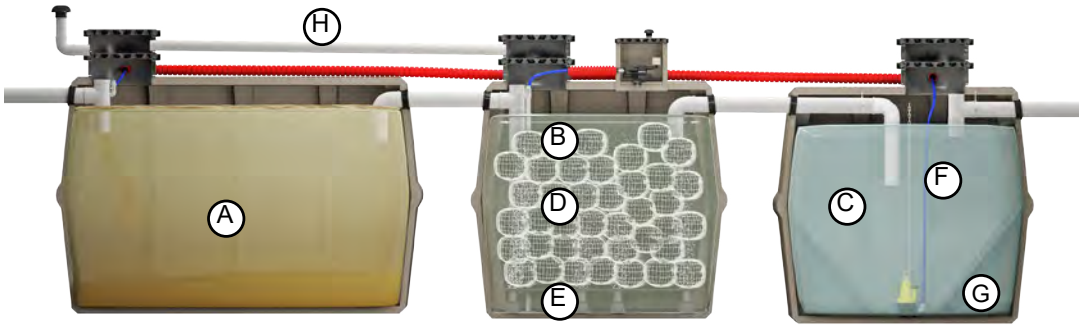
Purification performance

BOD_5 :	20	mg/L
TSS :	30	mg/L



* We recommend placing a grease trap for treating waste water generated by a restaurant, kitchens used for commercial purposes, etc.

FEATURES



ELECTROMECHANICAL COMPONENTS

Blower

Quantity :	1	pc(s)
Type :	side channel air blower	
Installed power :	1.50	kW
Power consumption :	1.05	kW
SPL (Sound Performance Lab) :	61	dB(A)
On / Off :	32/28	min.
Voltage :	3x400V	

Air Diffusers

Quantity :	15	pc(s)
Type :	fine bubbles	

Sludge recirculation

Type :	submerged pump	
Installed power :	0.85	kW
Power consumption :	0.85	kW
On / Off :	14/46	min.

Control panel

Type :	inside

Legend

A	Primary settling compartment
B	Biological reactor
C	Secondary settling compartment
D	Bacterial support
E	Diffusers
F	Sludge recirculation
G	Settling cone

APPROVALS AND CERTIFICATES

: 2014/04/142/A

Eloy Water SA
Zoning de Damré
rue des Spinettes 7
4140 Sprimont
B e l g i u m
T. +32 4 382 44 00
F. +32 4 382 44 01
info@eloywater.com
www.eloywater.com

DIMENSIONS | VOLUMES | WEIGHTS

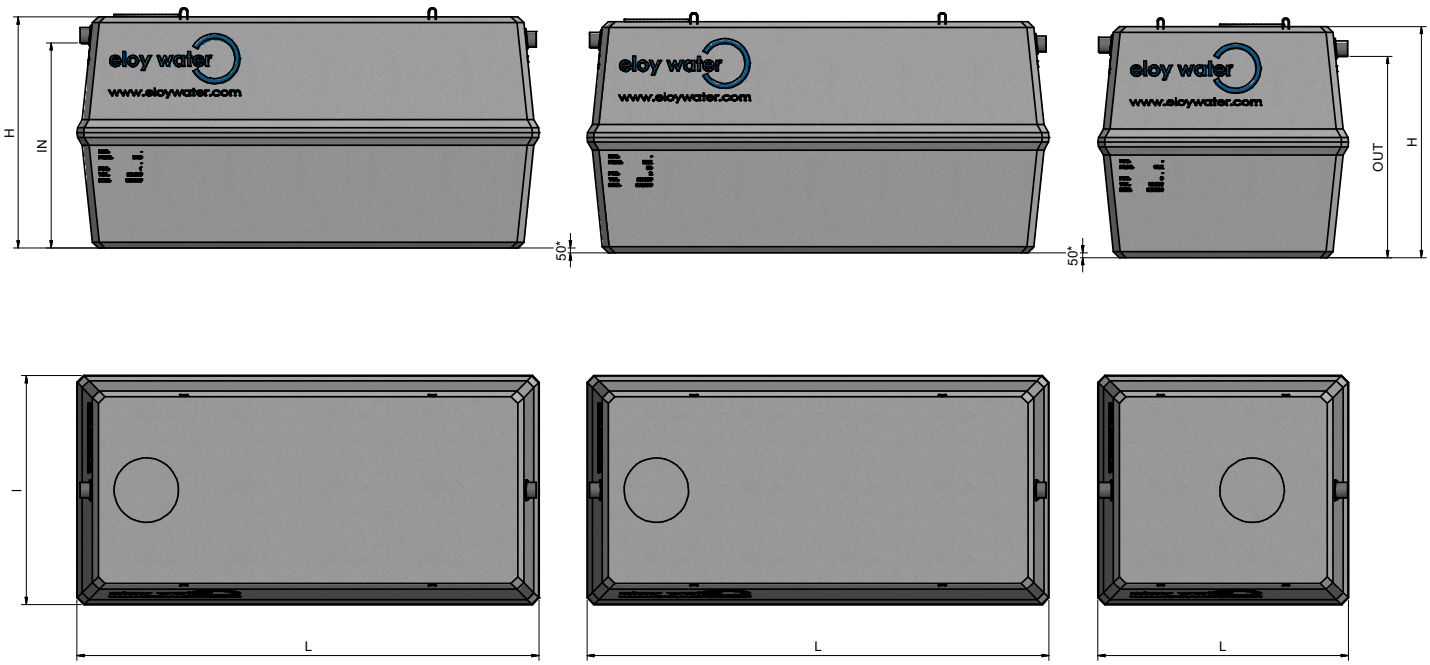
Measure	Unit	Tank 1	Tank 2	Tank 3
Total height* :	(cm)	240	240	240
Entry height* :	(cm)	213	213	213
Exit height* :	(cm)	209	209	209
Length :	(cm)	480	480	260
Width :	(cm)	238	238	238
Total volume :	(m^3)	20.00	20.00	10.00
Useful volume :	(m^3)	18.16	18.16	9.19
Weight :	(T)	9.10	9.95	5.82
Weight (w/o shipping cover):	(T)	-	-	-
Manhole(s) :	(cm)	1 x Ø60	1 x Ø60	1 x Ø60
Ø In / Out :	(mm)	160/160	160/160	160/160

* tolerance ± 2 cm

Material

Tank(s):	High performance steel reinforced concrete
Biocarrier:	Recycled PP
Air feed pipes:	PVC PN16

TANK DIMENSIONS



OPERATION

Useful volumes/surfaces

Primary settling compartment:	18.16	m^3
Biological reactor:	18.16	m^3
Clarifier:	4.41	m^2

Operation

Sampling chamber:	integrated
Theoretical desludging frequency:	every 13 months
Approximate energy consumption:	6,643 kW
Maintenance frequency :	annually (recommended)
Admissible load :	80 cm of fill + pedestrian load

Consumables

Blower filter:	annually
Blower membranes:	-
Air diffusers:	every 8 years

OPTIONS

Wall support for blower	
PE/concrete tank cover riser	3 pces
PE/steel tank cover	3 pces

GUARANTEES

Electromechanical kit :	2 years
Tanks :	10 years
Resistance :	B125

Sheet version: 20150609
Product version: 20140606

APPENDIX F – Wastewater Calculations

Pressure Compensating Dripper Irrigation Design (PCDI) for Club House, Accommodation Units and Driving Range Shed

Daily flow:	11,000	litres/day/person	Guidelines for on-site sewage systems in the Wellington Region; Table 7
Soil category:	1		AS/NZS 1547:2012, Table 5.1
Areal loading rate:	5	litres/m^2/day or mm/day	Auckland Council Guideline GD2018/006, E2.2.2.1
Design land application area:	2200	m^2	
Reserve land application (50%):	1100	m^2	Auckland Council Guideline GD2018/006, E2.2.2.1
Total land area:	3300	m^2	
Land application dimensions:	10m x 37m + (5m x 37m {reserve})		
Line spacing 1m centres	3300	linear metres	

Pressure Compensating Dripper Irrigation Design (PCDI) for Owner's Cottage and Stables (domestic only)

Daily flow:	1,260	litres/day/person	Guidelines for on-site sewage systems in the Wellington Region; Table 7
Soil category:	1		AS/NZS 1547:2012, Table 5.1
Areal loading rate:	5	litres/m^2/day or mm/day	Auckland Council Guideline GD2018/006, E2.2.2.1
Design land application area:	252	m^2	
Reserve land application (50%):	126	m^2	Auckland Council Guideline GD2018/006, E2.2.2.1
Total land area:	378	m^2	
Land application dimensions:	10m x 24m + (5m x 24m {reserve})		
Line spacing 1m centres	378	linear metres	

Pressure Compensating Dripper Irrigation Design (PCDI) for Maintenance Sheds

Daily flow:	2,000	litres/day/person	Guidelines for on-site sewage systems in the Wellington Region; Table 7
Soil category:	1		AS/NZS 1547:2012, Table 5.1
Areal loading rate:	5	litres/m^2/day or mm/day	Auckland Council Guideline GD2018/006, E2.2.2.1
Design land application area:	400	m^2	
Reserve land application (50%):	200	m^2	Auckland Council Guideline GD2018/006, E2.2.2.1
Total land area:	600	m^2	
Land application dimensions:	10m x 37m + (5m x 37m {reserve})		
Line spacing 1m centres	600	linear metres	

NOTES:

1. TOTAL CUT VOLUME 118,000m^3.
2. TOTAL FILL VOLUME 83,000m^3.
3. TOTAL EARTHWORKS AREA 114,000m^2.
4. EARTHWORKS SHOWN IN BULK VOLUMES ONLY (NEAREST 1m).
5. GOLF COURSE ROUTING AND LEVELS BY DARIUS OLIVER, PLANET GOLF.
6. FINAL DESIGN LEVELS AND EARTHWORK EXTENTS TO BE DETERMINED AT THE TIME OF CONSTRUCTION.
7. CUT/FILLS TO BE CERTIFIED BY ENGINEER
8. SEDIMENT CONTROL MEASURES TO BE AS PER "EROSION AND SEDIMENT CONTROL GUIDELINES FOR THE WELLINGTON REGION".
9. SITE TO BE PROGRESSIVELY STABILISED AS WORK PROCEEDS WITH TOPSOIL, MULCHING AND GRASS COVER.
10. FAIRWAY AND GREENS WILL BE CONSTRUCTED IN ACCORDANCE WITH THE MAHI TAHI CONSTRUCTION PROCESS DATED 1ST DECEMBER, 2020.
11. VOLUMES CALCULATED BETWEEN EXISTING SURFACE AND PROPOSED SURFACE.
12. AREAS 11 AND 12 FROM THE BML REPORT ARE NATURAL WETLANDS. NO EARTHWORKS ARE TO OCCUR WITHIN 10m OF THESE AREAS. NO EARTHWORKS WITHIN 100m WILL RESULT OR LIKELY TO RESULT IN COMPLETE OR PARTIAL DRAINAGE OF ALL OR PART OF THE NATURAL WETLAND.

LEGEND:

- CONSTRUCTION NO GO AREA
- EARTHWORKS EXTENT
- SILT FENCE
- BUND

N

HOLE 3

HOLE 4

BUND TO FOLLOW CONTOURS WHERE POSSIBLE, AT THE DIRECTION OF THE ENGINEER

HOLE 18

HOLE 17

HOLE 12

HOLE 5

HOLE 11

SILT FENCE

HOLE 16

m

PREPARED BY: LANDMATTERS	CLIENT: GRENADIER LIMITED	PROJECT: DOUGLAS LINKS - OHAU	DRAWING TITLE: ESCP PLAN NORTH WEST CORNER

DATE: 03/09/2021 | PROJECT NO.: 709

SCALE: 1:1000 @ A1, 1:2000@ A3

DRAWING NO.: J709-ENG-150 | REV: B

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NOTES:

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LEGEND:

CONSTRUCTION NO GO AREA

EARTHWORKS EXTENT

SILT FENCE

BUND

N

NO WORK WITHIN 10m OF DELINEATION 11 (BML)

HOLE 2

BUND TO FOLLOW CONTOURS WHERE POSSIBLE, AT THE DIRECTION OF THE ENGINEER

HOLE 1

DRIVING RANGE

PREPARED BY LANDMATTERS

CLIENT: GRENADIER LIMITED

PROJECT: DOUGLAS LINKS - OHAU

DRAWING TITLE: ESCP PLAN NORTH EAST CORNER

DATE: 03/09-2021

PROJECT NO.: 709

SCALE: 1:1000 @ A1, 1:2000@ A3

DRAWING NO.: J709-ENG-151

REV: B

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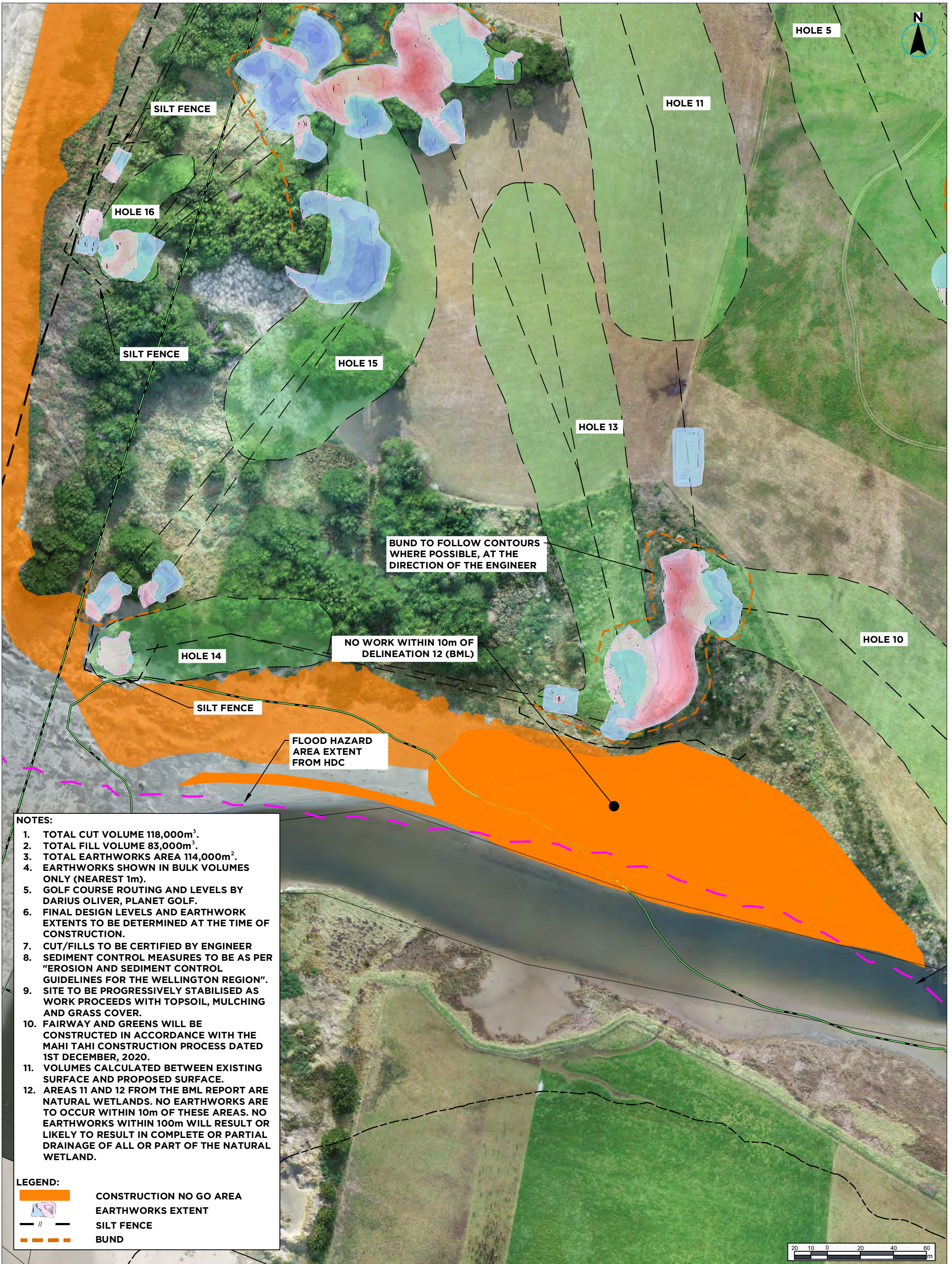

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LEGEND:

- CONSTRUCTION NO GO AREA
- EARTHWORKS EXTENT
- SILT FENCE
- BUND

PREPARED BY LANDMATTERS

CLIENT: GRENADIER LIMITED

PROJECT: DOUGLAS LINKS - OHAU

DRAWING TITLE: ESCP PLAN SOUTH WEST CORNER

DATE: 03/09/2021

PROJECT NO.: 709

SCALE: 1:1000 @ A1, 1:2000@ A3

DRAWING NO.: J709-ENG-152

REV: B

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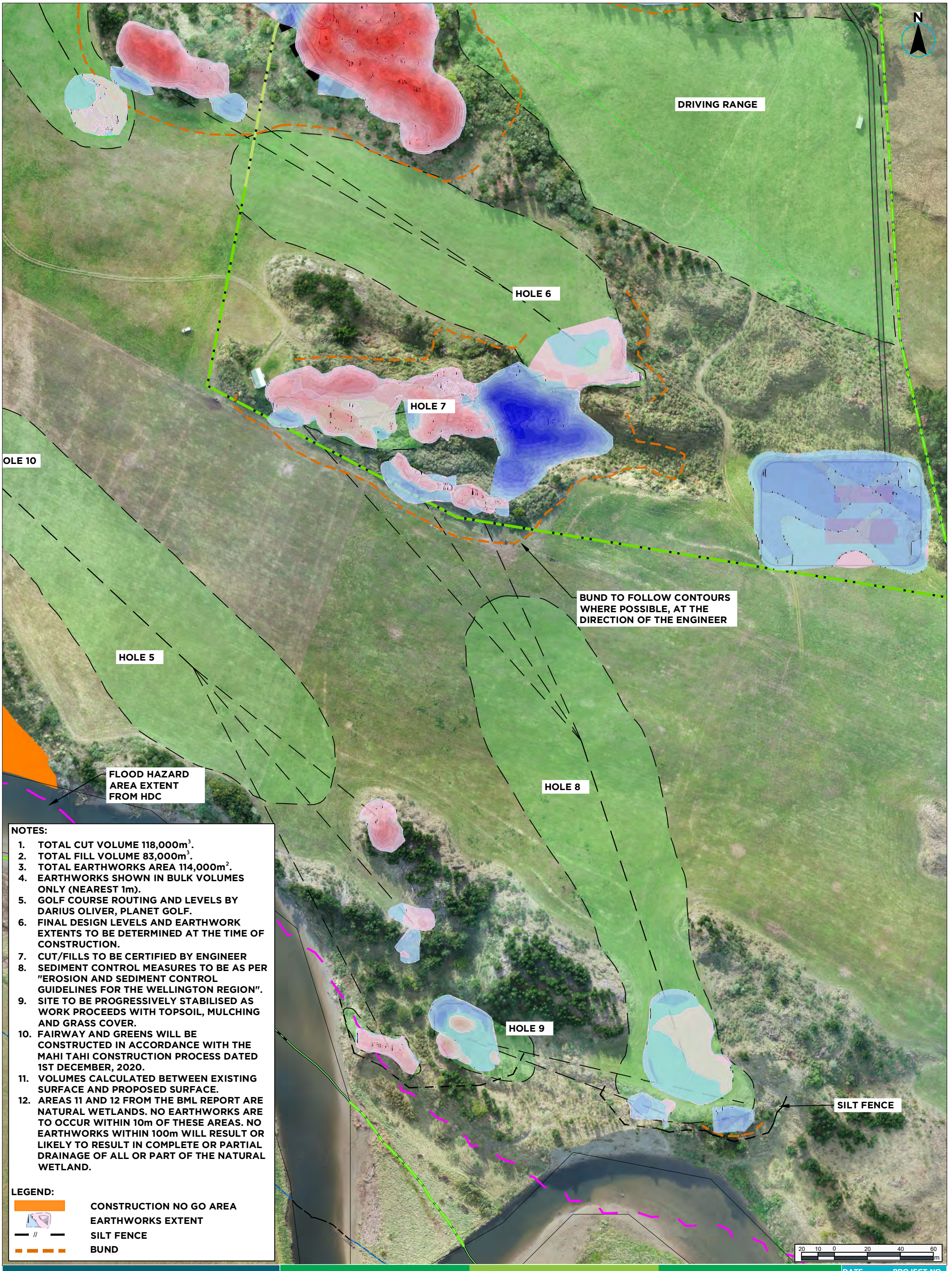

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- EARTHWORKS EXTENT
- SILT FENCE
- BUND

PREPARED BY LANDMATTERS

CLIENT: GRENADIER LIMITED

PROJECT: DOUGLAS LINKS - OHAU

DRAWING TITLE: ESCP PLAN SOUTH EAST CORNER

DATE: 03/09/2021 | PROJECT NO.: 709

SCALE: 1:1000 @ A1, 1:2000@ A3

DRAWING NO.: J709-ENG-153 | REV: B

C:\12dS\data\LM-DATA\709 - Grenadier Developments Limited - Douglas Links - Ohau_786\10 Plans, Aerials, CAD\Plans\ENG For RC - 2021-09-02.dwg, Plotted by Dan Turner at 3/09/2021 1:43:14 pm

Bay Geological Services Ltd
A C Johansen
RD6
Napier 4186

mobile: +64 275 014 984
email: baygeological@xtra.co.nz

7 September, 2021 ref: BGS258_02b

Grenadier Limited
c/- Tom Bland/Bryce Holmes
Land Matters Limited
20 Addington Road
RD1
Otaki 5541

Dear Tom and Bryce,

DOUGLAS LINKS APPLICATION FOR GROUNDWATER RESOURCES
765 MUHUNOA WEST ROAD, OHAU

Thank you for the email dated 2 September 2021 attaching the Horizons Regional Council Request for Further Information in relation to our expertise in hydrogeology. I have reviewed the request, and responses to the Horizons S92 points 2 and 3 (provided below), follow in Sections 1 and 2.

Groundwater

2. *The volumes applied for are considered to be reasonable and efficient, based on the SPASMO estimates present, however based on the information provided it is unlikely that the daily and annual volumes proposed can be achieved by abstraction from the Applicant's bore. It is therefore recommended that the proposed daily and annual volumes are reduced to be consistent with the maximum instantaneous rate; this would equate to a maximum volume of 1,388.45 m^3/day (1,388) and 208,267.5 m^3/day (208,268). Alternatively, further testing could be undertaken on the Applicant's bore to assess whether it can achieve the pumping rates necessary to abstract the proposed daily and annual maximum volumes.*
3. *Please provide an assessment of effects on the reduced groundwater discharge to the Ōhau River, saltmarsh and lagoon resulting from this groundwater abstraction.*

1. GROUNDWATER VOLUMES

Following a review of the Douglas Links new well aquifer pump test analysis, the indication from Horizons is that the Application volume should reflect the capacity of the new 150 mm diam. well which was tested at 16.07 l/s for four days. Therefore, using this as the maximum instantaneous rate equates to a maximum daily volume of 1,388.45 m^3 and 208,267.5 m^3/year as recommended by Horizons.

2. GROUNDWATER DISCHARGE TO SURFACE WATER

The Douglas Links new well aquifer pump test report provided by Bay Geological Services Ltd. in June 2021 discusses the potential for groundwater discharge to surface water features within the vicinity of the project area.

In 2019, GNS completed a geochemical and hydrochemical study of the Ohau and Waikawa catchments in the Horowhenua Groundwater Management Zone to understand groundwater dynamics, source, and hydrochemical processes (Morgenstern et al, 2019). The study included stable isotope and gas data analysis which determined that groundwater recharge is dominated by local rainfall, rather than from stream depletion. The determination of stream and river water ages enabled understanding of which strata preferentially allowed infiltration of rainwater into groundwater systems, along with recharge rates, areas of recharge and more importantly, areas of discharge.

Section 9.2 of the Bay Geological Services Ltd. report provides the following discussion:

> *A geochemistry study by GNS in 2019 on the Ohau and Waikawa catchments modelled groundwater interactions with surface water including recharge and discharge, using groundwater age, chemistry, gas, and isotope tracers (Morgenstern et al, 2019). The study revealed high radon concentrations along the lower reaches of the Ohau River and Waikawa Stream, indicative of significant groundwater discharge into the surface waterways just upstream of the confluence, beyond which surface water flows across the Quaternary sands. The sands exhibit low permeability, inhibiting groundwater discharge to the sea, instead, it discharges to surface water bodies once it reaches the coastal end of the transmissive Quaternary gravel beds.*

An investigation into the Kapiti Coast groundwater resource by Gyopari et al (2014), studied the Otaki groundwater zone located approximately 12 km south of the project area. Measurement of stream contribution in the Rangiuru Stream is predominantly from groundwater which drains from the shallow (Q1) gravels which lie behind the lower conductivity sand deposits along the present-day costal margin. This is also the case in the Q1 alluvium adjacent to the Waitohu Stream (Gyopari et al, 2014).

Deeper wells north of Waitohu Stream screened across the Q5 sediments (approximately 30 m depth) exhibit systematic seasonal variation indicative of rainfall recharge as inferred in Figure 1 below from Gyopari et al (2014). Interpretation of the lithology and aquifer parameters of the Applicant's well, suggest it is screened across the deep Q6 alluvium which is recharged by rainfall. The well is located near the coast and west groundwater discharge zones where shallow Quaternary gravels lie adjacent to low permeability sands further to the east.

Yours sincerely,

Alexandra Johansen
Principal Geologist/Hydrogeologist BSc (Hons)
Bay Geological Services Ltd

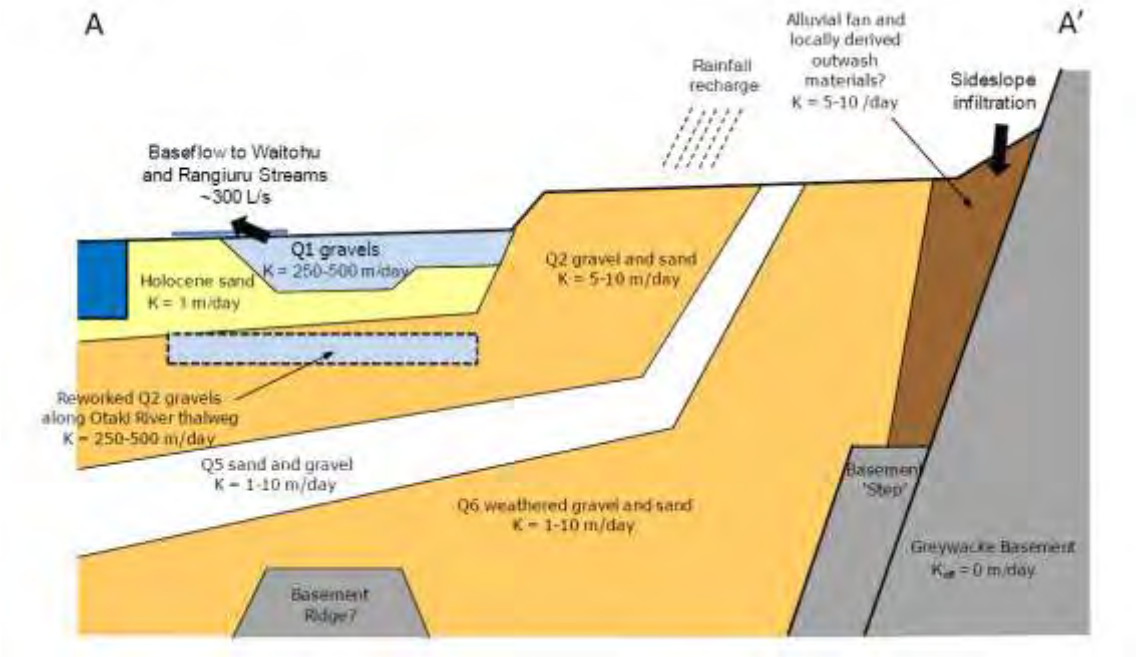

Figure 1: Schematic cross section of the Otaki groundwater zone (from Gyopari et al, 2014).

3. REFERENCES

Horizons Regional Council, 2021: Additional Information Request for Application APP-2020203164.01. Letter from Fiona Morton, Consultant Senior Consent Planner, (Horizons) to Tom Bland (Planner/Senior Resource Management Consultant, Land Matters Limited) on 1 September, 2021.

Morgenstern, U., van der Raaij, R.W., Baisden, W.T., Stewart, M.K., Martindale, H., Matthews, A., Collins, S., 2019: Ohau and Waikawa catchments of the Horowhenua Groundwater Management Zone: groundwater dynamics, source, and hydrochemical processes as inferred from the groundwater tracer data. Lower Hutt, N.Z.: GNS Science. GNS Science report 2018/06. 52 p.

Gyopari, M., Mzila, D., Hughes, B., 2014: Kapiti Coast groundwater resource investigation. Client report No. GW/ESCI-T-14/92 for Greater Wellington Regional Council. Wellington, New Zealand.

Report Limitations

This S92 response is written based on conditions as provided by third party contractors at the time of the desktop study report 'Douglas Links Well Aquifer Pump Test Report and AEE', Report No. BGS258_02 (Bay Geological Services Ltd, 2021). No interpretation is made on potential changes that may occur across the site or incorrectly reporting by third parties. Subsurface conditions may exist across the site that are not able to be detected or revealed by the investigation within the scope of the project, and are therefore not taken into account in this response. Furthermore, statements included within this response are assumptions made for the purposes of providing interpretations of site geology and aquifer pump test analysis.

9th September 2021

Attn: Grenadier Limited C/- Tom Bland/Bryce Holmes

Dear Tom and Bryce

Thank you for the email dated 2 September 2021 containing a request for further information in relation to my expertise in Golf Course Construction and Management.

As discussed previously I am uniquely qualified to discuss these matters having Horticulture and Amenity Turf Management qualifications and 25+ years of practical experience, most at the highest levels of golf in New Zealand. That experience spans multiple regions of New Zealand, almost all soil types, numerous different construction methods, and the full spectrum of grass varieties. I have worked with river sands in Hamilton, alluvial gravels in Canterbury, clays in Auckland, volcanic soils in Tauranga, and glacial silts in Otago.

I am also a former Board member and ex-president of the NZ Golf Course Superintendents Association, a former golf environmental award judge, a regular presenter at golf conferences, a former winner of NZ's premier golf course maintenance award, and a strong advocate for sustainable and environmentally responsible stewardship of the land.

I have reviewed the request, and my comments regarding points 4,11 and 16 are as follows:

4. Earthworks

<u>General comments</u>

The apparent concern around erosion, particularly wind erosion, on a pure sand site in entirely understandable and reasonable. It is also relatively simple to mitigate with correct earthworks staging and progressive stabilisation. Non wind-based erosion could be considered a very minor concern due to the high hydraulic conductivity rates of the sandy soils (tested at 345-413mm/hr), the lack of clear water courses, and the design of the golf course meaning the play corridors avoid the steepest land.

It needs to be highlighted that the natural contours and sand dunes are the reason Grenadier Ltd are so keen on this specific site. To allow them to become eroded or blown away would be counterproductive. While the coastal part of the site is almost perfect for golf, there are also other areas that will need to be carefully constructed by professional golf course shapers. This will come at significant cost to Grenadier Ltd and means erosion control will be front of mind simply to avoid having to repeat these works. The fine detail and subtlety of what seems like tiny contour changes to the uninitiated are what will help take Grenadier's links course to the level of design needed to make it financially viable long term. Golf Course construction staff will be 'locking down' those shapes immediately following completion.

From an agronomic and ongoing maintenance perspective it should be recognized that wind blow influences the size distribution of the sand particles and the uniformity of the soil. Areas where the finest sand particles may aggregate due to wind erosion will be more difficult to grow grass in long term. The finest sand particles will pack tighter, reducing aeration and water infiltration and will

likely create areas that increase ongoing maintenance requirements. Again, it is Grenadier's best interests to control any erosion.

Site observations have noted a substantial germination of native Fescue grasses on the site since autumn (Fescues are the grass varieties that have been selected for the proposed golf course). This has some very positive implications as it means significant areas of the site may not need to be exposed to erosion. If the 'native' Fescue population remains high enough, selective removal of undesirable grasses and weeds using targeted spraying, followed by overseeding with extra Fescue seed, will allow Grenadier to create suitable playing surfaces for golf without the need to open or strip the surface.

Onsite observations, along with the sand tests performed for Grenadier Ltd by the New Zealand Sports Turf Institute (NZSTI), indicate that the fine sandy soils pack tight and maintain good moisture levels with relatively low rainfall. This points to a relatively low levels of water being required to keep the soil damp and in place, which is very helpful for erosion control.

Progressive stabilization and open areas

Given the financial and agronomic implications of losing highly desirable existing contours and newly created shapes due to erosion, Grenadier has planned construction processes designed to minimize open ground to the areas its relatively small team can maintain control of. The exact size of the open areas will be partly contingent on the time of year with associated rainfall and germination temperatures, but mostly determined by Grenadier's ability to keep the areas irrigated to a level that quickly germinates and grows fine turfgrass.

The Golf Corridor

Open areas in the constructed golf corridor can be *broadly* broken into four categories:

1. Areas being stripped and cleaned in preparation for shaping – potentially exposed to erosion (generally <2Ha)
2. Areas with shaping recently completed and being prepared for seeding – potentially exposed to erosion (generally <1/2Ha)
3. Areas with irrigation installed and operational, seeded and hydro mulched and headed to germination – not erodible (generally <1Ha)
4. Areas with grass germinated and heading towards first mow – not erodible (generally <2Ha)

Irrigation availability is critical to grass growth, especially on sandy soils. Grenadier's golf course construction team will be working away from the irrigation source. This means installation of a suitable pumping system and pipe network is a precursor to starting to construct the golf corridor. While the existing farm supply and the use of water tankers would suffice for wind erosion control in the preliminary stages, prior to opening larger areas for golf construction a secure and rapidly expandable irrigation pipe network would need to be in place.

Grenadier has planned for the extensive use of Hydromulch and Hydroseeding to minimize erosion, along with the use of durable polymer-based erosion control products (e.g., GRT Envirobinder) should any areas that aren't irrigatable be at risk of erosion.

The Macrocarpa Trees

The Macrocarpa trees cover a relatively small % of the overall site but conceals some of the best contours for golf on the site. Those contours also provide great framing and separation of the golf holes and Grenadier will have no desire to lose those contours.

The size of the macrocarpa trees, and the health and safety of those involved requiring separation of large tree and golf construction works, means slightly different erosion control methods will be required than for the golf corridor. To help minimize erosion the stump and root systems of the macrocarpas outside the golf corridor will be left in the ground to break down over time. Areas between these stumps will be prepared and hydroseeded and irrigated adequately to achieve revegetation and full cover with the RBT site remediation plan. These areas will then be largely left their own devices once established.

Grenadier is proposing to leave much of the associated mulch and debris on the surface as a stabilizer prior to the golf course shapers entering the area to begin golf construction.

Inland Dune Seedling Pines and Scrub

The soil on the steeper inland dunes is to remain as untouched as possible. The steepness of these dunes is a big component of the visual appeal of the site, but they are largely avoided and played around from a golf perspective meaning they don't need to provide the same quality of turfgrass cover as the golf playing corridor. There will be only minimal soil disturbance in most of these areas, associated with the felling of the juvenile pines. To the extent the slopes allow these areas will be mulched with a forestry mulcher with the mulch left on the surface as a stabilizer and to naturally break down.

……

11. Ecological Matters – Hydrological and Nutrient effects

<u>General comments</u>

Based on observation during summer, autumn and winter, it is my view that the wetland on the site is more dependent on the level of the underlying ground water table than any runoff. This has been confirmed by the project ecologists (Boffa Miskell) and by the hydrogeologist. There are no spring fed features.

Any runoff will be minimal due to the sandy soils high infiltration and percolation rate (soil/sand hydraulic conductivity of 345-413mm/hr).

The removal of grazing cattle from the site would be expected to have a positive effect on water and nutrient levels in the wetland, particularly given the reduction in any potential for effluent based nutrient runoff.

The small wetland between Grenadier's proposed 2nd and 3rd holes has been frequented by animals, with evidence of wallowing, and both sign and sighting of Sambar deer. Upon the beginning of construction this will no longer be likely.

The grass varieties to be used are only successful under low nutrient and low soil volumetric water percentages. Excess fertilisation or irrigation has been proven to reduce their competitiveness against weed species resulting in low quality playing surfaces which will be unacceptable to Grenadier's future golfing guests.

Hydrological effects

Grenadier's golf construction team will using the native sandy soils and contours with only minor contouring changes, so there will be no significant change in runoff compared to the current situation.

The Fescue grass varieties chosen for this links golf course thrive under low moisture conditions. This means soil volumetric moisture percentages of less than 25%, which leaves significant room for infiltration rather than runoff. Standard golf course maintenance practices such as coring, spiking, and vertidraining will be regularly used to maintain consistency of water infiltration to maximise turfgrass health.

During the summer low rainfall period Grenadier will be irrigating the turfgrass to keep it healthy and to a standard required to meet high player expectations. However, over irrigation to the point of runoff produces undesirable soft playing surfaces totally incompatible with links golf. It will be in Grenadier's best interests to use their advanced irrigation control software to minimize runoff using such tools as soak times.

Nutrient Effects

Given the characteristics of the sandy soil, the ability to minimise runoff, the likely management practices, and the Fescue grass variety requiring minimal fertilizer inputs to establish and maintain, I would expect the nutrient effect to be minimal.

There would be no need to apply nutrients near any wetland to maintain the Fescue grasses. Modern golf course fertilizer application practices are focused on targeted low rate sprayed on foliar application of nutrients and nutrient rate decisions based on soil test results and minimum sufficient levels. A preliminary site soil test result from the NZ Sports Turf Institute via Hills Laboratories showed sufficient existing levels of Calcium, Magnesium and Potassium to grow Fescue. Should Grenadier need to apply corrective fertiliser, this would take the form of stable granular fertilisers applied immediately prior to seeding and incorporated into the soil surface, making nutrient runoff extremely unlikely.

Excessive nutrient application to fescue grasses has a negative effect by creating an environment better suited to weed competition. Links golf courses tend to be lean and lacking in turfgrass colour. Links grasses are fertilized only to maintain cover. Any excess growth would extra mowing – unlike a farming or cropping situation there is no commercial gain from dry matter production.

Phosphorus is generally considered the nutrient of greatest concern for wetlands. Fescues can be established with negligible levels of Phosphorus and maintained with almost none. It is highly likely that the conversion from farmland to golf course will see a significant reduction in the use of Phosphorus.

Grenadier Ltd will also be using buffer zones of longer grass and native plantings to reduce the likelihood of any nutrient runoff wherever needed. Evidence exists that simple steps such as cutting height changes in turfgrass reduce nutrient runoff.

……..

16. Ecology – Wetland drainage

The additional information request indicates a potential concern around the potential for drainage of natural wetlands. I believe the possibility of natural wetland drainage as a result of the golf course to be almost nonexistent.

The native sandy soils on the site are very well suited to producing high quality firm and bouncy Fescue playing surfaces, and a key reason Grenadier Ltd is attracted to the site. Links golf courses are meant to be firm and dry. Sandy soils provide the free draining characteristics ideal for the construction of golf courses. Indeed, sand is frequently imported into golf courses to build greens and tees on and to be used as a topdressing medium to firm up surfaces. Grenadier will want to maintain wetland features to enhance the appeal of the wider golf landscape. Unlike the farms in the surrounding area there is no advantage to capturing moisture retentive soils to create 'productive' land.

There will be no topsoil imported to site. Grenadier will be exclusively using the existing sands from the site and from the immediate surrounds of each specific zone. There should be no noticeable or measurable change in moisture retention. There are no upsides to Grenadier moving more moisture retentive soils into the areas meant for golf turf. Again, moisture retaining soils mean softer surfaces which lead to poorer playing conditions, extra growth to mow, and invasion of weed species grasses such as Poa Annua. Lower moisture soils encourage deeper root systems which can access natural rainfall and nutrients at depth better and leads to healthier grass requiring less fungicide and fertiliser.

Grenadier will not be contouring to lead water away from the wetland.

Additionally, the water level in the wetland is likely determined more by the level of the water table rather than runoff or seepage from surrounding soils.

To meet the summer survival and health requirements of the Fescue turfgrass, Grenadier would potentially apply approximately 300mm of irrigation in the summer months when natural rainfall isn't frequent. I suspect that irrigation in the absence of rainfall would be more likely to enhance any wetland than detract from it, although the effect would be small enough to not be able to be measurable.

……

Should you require any further clarification on any of the above, please feel free to contact me.

Kind regards,

Brendan Allen,

Head of Construction of the Douglas Links,

Grenadier Ltd, Wellington, NZ

e. brendan@douglaslinks.co.nz – m. +64221656729

Douglas Links - Horizons Response Letter

This response has been prepared by Darius Oliver as the lead Golf Course Architect for the Douglas Links.

My involvement in this project dates back to January 2020, when I was first engaged to survey the land at Ohau and determine its suitability for a world-class 'links style' golf course.

I have previous golf course design experience, as the designer of Cape Wickham Links on King Island in Tasmania, which is ranked the #1 public access golf course in Australia, and among the Top 25 golf courses in the World. I also designed the 9-hole Farm course at The Hills Golf Club in Central Otago, and am currently engaged as the designer of The Cliffs golf course on Kangaroo Island in South Australia, and as design consultant on two courses at Thirteenth Beach in Victoria. Aside from The Hills, each of the other golf courses are built on sandy, links-style, sites like at Douglas Links.

Beyond my expertise in golf course design, I am also an author and the publisher of the Planet Golf series of books. For the four Planet Golf volumes I have studied golf courses in 40 countries and been fortunate to visit more than 2,000 golf courses worldwide.

It appears the Regional Council are seeking to ensure the project team have been considerate to the environmental values on the subject land through asking questions around assessment of alternative locations for the golfing aspects of the Douglas Links. An understandable request. I have prepared the following statement to explain those considerations and also describe the reasons for the current layout.

In terms of alternative approaches, I have worked with the project landscape architects and ecologists (including Dr Boffa, Mr Jim Dahm, Boffa Miskell and RBT Design) to amend the layout of the course to respect the environmental values of this area. I understand maps will be produced to demonstrate the iterative process that the project team has been through to ensure the Douglas Links was not the only consideration in design, but rather ensuring the golf course did not override important environmental values.

There are more than 30,000 golf courses in the world, yet only a few hundred that could be accurately described as a '*links*'. Golf was born along Scotland's East Coast more than 500 years ago, its earliest courses known as '*links*' because they were built on undulating, sandy ground with little agricultural value. This ground generally *linked* the sea and beach areas with the more productive farming land, hence the term '*links*'.

In my travels I have been fortunate to play and study all of the world's premier golf courses, including each of the famous ancient 'links' in Britain, Ireland, Europe, Australia, New Zealand and North America. The best golf courses worldwide have a clear character, an emphasis on fun and natural beauty, and a strong sense of place. There are great links courses that occupy softly, rumpled ground and others that weave in and out of larger sand dunes. Some get right beside the beach while others afford more distant coastal views and settings. Each is naturally attractive, easily walkable, publicly accessible and complete with holes that feel like they were 'discovered', rather than 'created'.

The aim is for the Douglas Links to provide a similar world-class '*link*s' golf experience, and to stand out as one of New Zealand's premier golf courses, and one of its most natural. While there is room on the privately held land parcel at Ohau to accommodate 18 holes, there would be little interest in a golf course here that did not enjoy the views of the sea, the coastal air, sea breeze and vistas to Kapiti Island and the Ohau River. The design of the Douglas Links allows for those coastal processes to be experienced through just a minor occupation of the dunes areas. Without that enjoyment a golf course in this location would not be a true *links* course, and be unlikely to appeal to the discerning golfer.

Instead, Grenadier seek to create a true modern golf icon; a course so memorable that it is capable of attracting local and overseas golfers to the region for years and decades to come. In order to achieve this goal, Grenadier will need to use both private land as well as a small part of the Esplanade reserve, some of which is classified as a 'Schedule F' area in the planning documents. The reason this coastal land is essential for this project is two-fold. Firstly, it houses three of our most exciting holes (4, 16 and 17). Secondly, it enables the entire golf course to be built with a 'least disturbance' mindset.

The small occupation of part of this degraded ecosystem shall be offset by heavy indigenous planting elsewhere along the coastal margin, and mitigated by ongoing professional land management and the knowledge that these three holes are crucial to the overall appeal and success of the project and will alone attract many golfers to the Horowhenua District.

As highlighted in the Boffa Maskill ecological report, Grenadier's proposal brings significant benefits to the broader development area, including the coastal margin. Not only will non-native trees, weeds and livestock be removed from the site, there will be a heavy revegetation program undertaken, with native species like Sand Daphne planted along unused sections of the esplanade reserve, and elsewhere on the private parcel. There will also be Kanuka plantings on the private land. The entire site will then be professionally managed and maintained in perpetuity, by a team of highly skilled and passionate green keepers whose job will involve not only maintaining playing surfaces for golfers, but ensuring that the surrounding dunes are weed and pest free, and that they continue to properly showcase the beauty and diversity of local plant life.

We believe, that for Douglas Links to appeal to global golfers we need to showcase the stunning landforms of Ohau in the best, and most natural, light possible. The additional planting and ongoing management of these coastal dunes will not only keep the entire area attractive for visiting golfers, it will certainly prove a more sustainable use of the land than at present, and help to preserve the diversity of the region much more sensitively. We hope that through the removal of large introduced trees along the boundary of our property, and a combination of sensitive native plantings and ongoing land management, that we are able to create one of the best restored, and well-maintained, stretches of dune land in New Zealand.

Among the attractions, for golfers, at Ohau are the variety of coastal landforms and the variety of coastal views across the property – be they beach or river, ocean or offshore islands, or even panoramic landscape sight-lines from the elevated riverside bluffs. What excites our team about this project, is not only that the golf experience is sure to be a visual feast from start to finish, but that the natural dunes and natural '*links-like*' landforms are as appealing, for golfers, as these incredible views. This is particularly true of the larger ridges and sand hills nearest the private / esplanade boundary. Golfers love big sand dunes, and we are blessed with some magnificent structures throughout this transition zone.

In order to be able to build the best possible golf course on this land, and to navigate through some of the heavier landforms without major earthworks, we will need to use sections of the esplanade to accommodate holes 4, 16 and 17. Each of these holes has tremendous golf potential. They are also important parts of the overall golf routing, and crucial to the broader development journey.

In many ways these holes are the Douglas Links equivalent of the seaside holes at Royal County Down in Northern Ireland, or Barnbougle Dunes in Australia, both Top 30 in the world standard golf courses. As with these global examples, the dune land at Ohau provides both exceptional golf across rumpled sandy land, whilst helping provide golfers with an interesting and varied assortment of coastal views during their round.

Owing to the somewhat degraded and constricted nature of the private land parcel, without access to a small part of the esplanade and the ability to create these three beautiful holes, we would need to manipulate the boundary dune land to provide sufficient space for playable golf corridors. The additional earthworks would not only increase the cost and difficulty of construction, they would reduce the scale of the natural dune land and, arguably, spoil the very element that we believe will draw golfers to this part of the New Zealand coastline.

The clearest example of how excluding the small part of the esplanade impacts on the overall golf course, and the earthworks needed to complete construction, is the building of a 4th hole somewhere between our 3rd green and 5th tee. The proposed 4th hole tumbles across what are mostly gentle undulations, ideal for golf and with stunning outlooks toward the sea and Kapiti Island. The dunes on the east of the hole tower above the fairway and, though far too large and extreme for

golf, they are magnificent in scale and structure. They offset the hole perfectly, and help the golf course feel like it is part of a unique and impressive, ancient setting.

Without access to part of the esplanade for hole 4, Grenadier would need to significantly reshape these dunes and lower them by several metres. Leaving a scar on the landscape would be somewhat inevitable, as would the sense from golfers that they were being denied access to what appears to be a perfect '*links*' hole on the other side of the fence. Neither outcome is going to help this golf course succeed and would result in far greater disturbance on the coastal environment.

We believe the impacts on the natural landscape in such a case would be significant, and also that the subsequent diminishing of the overall golf experience would make development next to impossible. As I'm sure you are aware, Grenadier have no interest in building a golf course simply for the sake of it. This project needs a world-class golf layout, in order to generate attention in the short-term, and to continue to attract the discerning golf traveller *to* the Horowhenua District in the longer term.

Like the world's best ancient links, Grenadier want the Douglas Links to be successful, for the business to endure and for the golf course to be able to draw visitors from all corners of the world for decades to come. This promotional aspect is not to attract large numbers of people at any one time, and in fact the appeal of the course is to allow only a few on the Links during the course of a day so they have a sense of wilderness while enjoying a recreational activity.

Our strong view is that the golf course needs to be world-class for the business to be sustainable, and for the environmental benefits of removing livestock from the area and reintroducing and managing native plant species to be realised in the long-term.

Darius Oliver.

Extent of UAV Coverage

N

LEGEND :

- Boundary
- Greens
- Maintained Turf Areas
- Original Green / Fairway Outline (August 2020)
- Hole Centreline
- Original Hole Centreline
- A — Change Since Original Design

Ohau River

Range Tees

32 16 0 32 64 96 m

PREPARED BY LANDMATTERS

CLIENT: GRENADIER DEVELOPMENTS LIMITED

PROJECT: DOUGLAS LINKS - OHAU

DRAWING TITLE: COURSE LAYOUT ITERATIONS

DATE: 8/9/2021

PROJECT NO.: 709

SCALE: 1:1600 @ A1, 1:3200@ A3

DRAWING NO.: 709-LAYOUT-CH

REV: -

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Boffa Miskell

Memorandum

☐ **Auckland**
PO Box 91250, 1142
+64 9 358 2526

☐ **Hamilton**
PO Box 1094, 3240
+64 7 960 0006

☐ **Tauranga**
PO Box 13373, 3141
+64 7 571 5511

☑ **Wellington**
Level 4
Huddart Parker Building
1 Post Office Square
PO Box 11340, 6142
+64 4 385 9315

☐ **Christchurch**
PO Box 110, 8140
+64 3 366 8891

☐ **Queenstown**
PO Box 1028, 9348
+64 3 441 1670

☐ **Dunedin**
PO Box 657, 9054
+64 3 470 0460

Attention:	Tom Bland and Bryce Homes
Company:	Grenadier Limited C/- Land Matters Limited
Date:	8.09.2021
From:	Dr Vaughan Keesing
Message Ref:	Douglas Links Golf Course, Ohau - Section 92 responses - Ecology

Dear Sirs

The following are our reposes to the Horizons section 92 – on ecological matters. In the following we repeat verbatim the Section 92 ecological request in red and then supply our responses and additional information. There is one appendix which is the additional vegetation map requested.

Ecological matters raised

5. Please demonstrate/justify why the permanent loss of rare and threatened ecosystems as identified within schedule F of the One Plan cannot be avoided in the first instance.

Response:

This is not an ecological matter for the ecologists to answer, other than to say while there are relatively small areas of golf course technically in Schedule F identified habitat, they are few and related in the main to knobbly club rush modified hind dune and an area of weedy foredune, not ecologically valuable communities in good quality schedule F habitat. In part the schedule F boundary recognised on site initially by Horizons was based on the dominant landform (dune) rather than the vegetation, and the golf course fairways that extend into the zone are largely intruding into exotic vegetation of low value. As Dr Boffa and the Golf Course Architect (Mr Oliver) note, the Douglas Links seeks to retain the majority of the landform to give the course its 'links' character and therefore the integrity of the schedule F values identified in the Horizons assessment will remain. The assessment reflects these intrusions through the condition and values of the actual impact not, on the overarching label.

6. Please undertake a wetland delineation assessment (in line with the NPS FM) to establish the true extent of wetlands including the saltmarsh, the Raupo wetland and within Vegetation Community 2.

Response:

The true extent is as reported and mapped consistent with the intent of the NPS FM. There is no need to undertake the delineation process where it is clear from the rapid assessment method that there is no need for plots to be set down. Delineation using either Clarkson 2018 or MfE 2020 is where there is uncertainty over either the wetland boundary or if a feature could be a natural wetland. The surveys were carried out by very experienced wetland specialists (and botanists) (Mel Brown and Pat Enright) who did not locate any natural wetland in community 2 and as reinforced by the recent MfE (sept 1 2021) discussion document, we note that the NPS-FM does not seek to capture wet pasture.

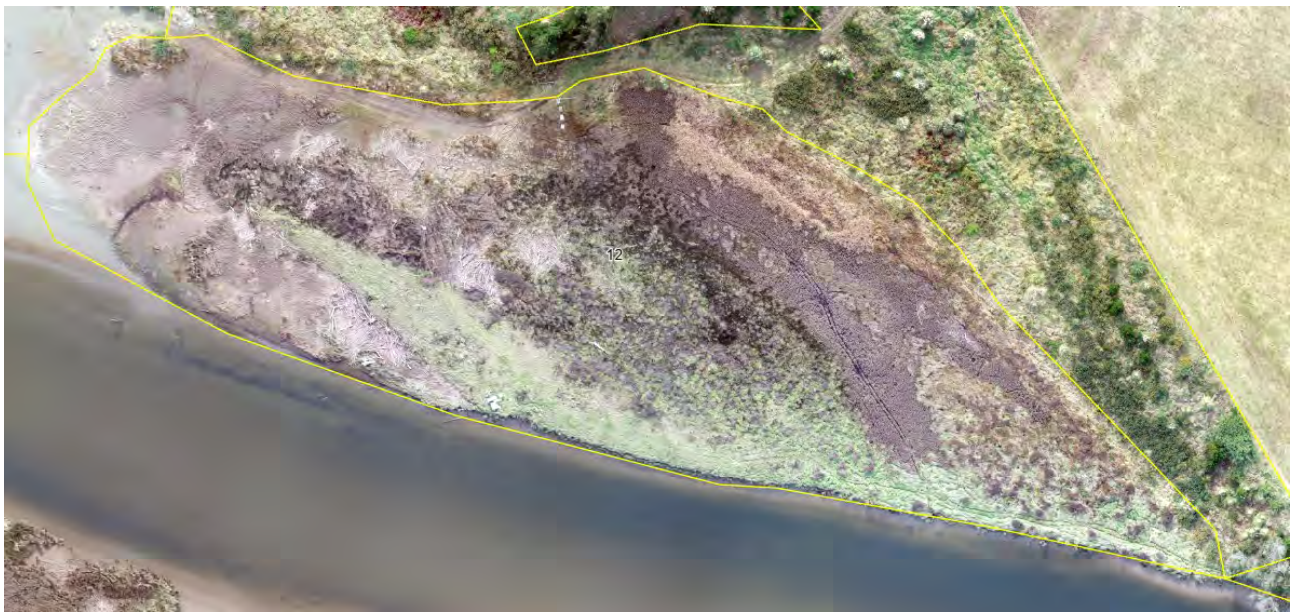
We assure the Council that there was not, by way of the delineations first step “rapid assessment”, any vegetation or hydrology cue to undertake the natural wetland “delineation” protocol in community 2.

The inland freshwater wetland that was located and identified had very clear and topographic boundaries (raised surrounding lands) and it does not require plot delineation. The unusual circular shape of the feature our team identified could well be ‘constructed’ but it is not worth investigating that further when it can be avoided by the Applicant. Furthermore, the salt marsh boundary was initially fixed by Horizons and our team have expanded that boundary based on our filed work and with a conservative buffer.

Through the recommendation in our report, the Applicant has sought to avoid the feature from disturbance resulting from construction of the Course. For completeness we do note that the salt marsh is technically not covered by the NPS FM as that policy statement only covers inland *freshwater* wetlands and not *saline* coastal wetlands. Nevertheless, the salt marsh is within the Coastal Environment and therefore covered by the New Zealand Coastal Policy Statement (NZCPS). Our assessment has considered the NZCPS and it is clear that the proposed activities seek to avoid the salt marsh from disturbance but the restoration plan by RBT and Dr Boffa seek to undertake active management and further planting at its margins.

Returning to the identification of the wetland types on and around the Course, we produce two high resolution aerials as evidence of these clear boundaries.

Raupo circular depression wetland.



Coastal salt marsh edge identified with a buffer added.

7. Please provide a map that overlays the areas proposed for vegetation clearance/earthworks with areas of rare and threatened ecosystems. It does appear that some of the holes proposed (specifically hole three) appears to remove a portion of a Schedule F area of Kanuka. Please provide a map combining both sets of information

Response:

We apologise and appreciate the question. The required map was produced but it clearly did not get attached as the replacement for Map three in Appendix 1 as was intended. It is attached to this document.

On the matter of kanuka, we understand that while the fairway does show inclusion of areas of the kanuka, we understand, and as evidenced in our AEE, that the main stands of kanuka areas are not being cleared or otherwise impacted and the fairway will operate around those areas.

8. Please provide comment on the differences between the vegetation assessments undertaken by the Regional Council's Ecologist (which identifies a large area of Kanuka forest or tree land within the north of the property) and the mapping undertaken by Boffa Miskill (sic), which shows a significant reduced area of Kanuka forest.

Response.

From the ecological survey perspective we cannot comment on the investigation the Horizons assessor undertook to delineate the actual boundary of the kanuka, but we suspect that they did not field verify the full extent of the type, as one area labelled kanuka (the western most area) is in fact macrocarpa and silver birch. It could simply be a difference in mapping equipment or aerial photography. We mapped and highlighted only that kanuka area that met the schedule F criteria but all kānuka found is mapped (community 8). If this is carefully traced it can be seen that the BML kanuka map reveals kanuka in more areas than the Horizons map. Although not a peer review, we have been provided with a map prepared by the project coastal geomorphologist (Jim Dahm) whom assessed the site before our team did. Mr Dahm's map is consistent with our mapping and is a good corroboration of the area of Kanuka.

In any case we can only comment on what were found and mapped on site and that is reported in the AEE, and that Retrolens (historic aerials) do not show such an extensive area of kanuka either.

9. Please provide an assessment on Katipo Spider, include survey on presence and potential effects

Response.

Katipo were searched for in the survey field investigations (Ms Amanda Healy is our herpetologist and macro-invertebrate field ecologist and has 5 years' experience with BML in undertaking field surveys for lizards and invertebrates). While a difficult species to find without trapping, the surveys by Amanda did not find any sign of katipo. Our experience with similar survey is that if there was an appreciable density of katipo sign would have been found.

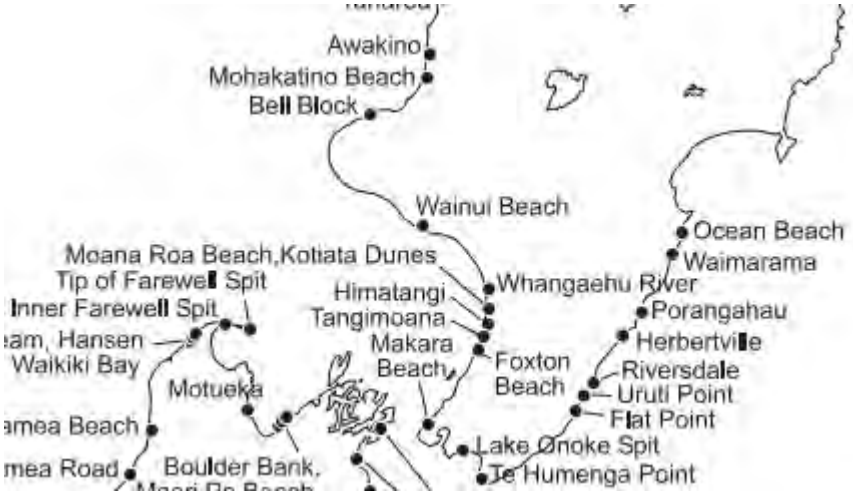
The literature (Patrick 2002, Costall and Death 2010[1]) suggests that while there are "strongholds" in Foxton to Himitangi and Makara beach and the Wellington south coast (Te Humenga Point) there is no indication of populations south of Foxton to Makara. This may reflect a lack of survey effort, but it also indicates that the Ohau River outlet area was not identified as a high probability site.

Nevertheless, it may be that katipo are present. If they are they will be present in the foredune amongst the spinifex and drift wood, not in the hind dune amongst the exotic dune vegetation. *Steatoda capensis* (the south African invader) is most likely the dune spider present if any are present in the hind dune - but again these are most likely in the spinifex foredune.

The proposed golf course intrudes into the hind dunes (near the sand daphne populations) it does not enter into Katipo habitat.

Survey sites for the red katipo (from Patrick 2002) are shown in the following image.

[1] Patrick B 2002. Conservation status of the New Zealand red katipo spider (Latrodectus katipo Powell, 1871). Science for Conservation 194: 33 p.
A Costall & Russell. G Death (2009): Population structure and habitat use by the spider Latrodectus katipo along the Manawatu–Wanganui coastline, New Zealand Journal of Zoology, 36:4, 407-415



10. Please provide further investigations on the impacts on native lizards. Specifically, it is documented within the Department of Conservation's database that the Wellington Green gecko and ornate skink have been recorded within 8 km of the site in similar degraded and isolated vegetation pockets.

Response:

It appears the Wellington green gecko record being referenced is from 1972, and is therefore nearly 50 years old. We consider records this old to be out of date and not representative of current populations, especially for species like the Wellington green gecko which has had a marked decline in the region over recent years, and is "no longer being recorded from many sites known from the 1970s" (Crisp, P., 2020). The site has been isolated from source populations since the arboreal vegetation has regenerated, and it is considered very unlikely that arboreal geckoes are present here.

For ornate skink, there are some more recent (but still fairly old) records in the surrounding areas (early 1990s). However, their populations are known to be very sensitive to high mouse numbers, and so it is considered unlikely that a population would be able to persist at this site given the considerable number of mice observed using the CritterPics, and the lack of appropriate refugia present (e.g. thick leaf litter, rock piles, etc). It is perhaps possible that they are present in very low numbers, but we would not consider that to constitute a stable population.

Furthermore, the survey effort undertaken would only likely detect lizard species if they were in abundantly high numbers and not at moderate to low level populations.

Response:

Our previous trials using CritterPics have shown them to typically be more effective at detecting lizard populations than many of the methods currently in common use. While we agree that they may not detect very low populations of lizards, we do believe that they would have detected moderate or high populations. Additionally, the very high numbers of mice (plus several hedgehogs) detected using the CritterPics, and the numbers of mammalian tracks (stoats, feral cats) seen on the site indicate that any lizard populations would likely be heavily suppressed, if present at all.

Additional the survey effort has largely been focused predominantly in the Active Dune and has ignored over habitat throughout the site.

Response:

The duneland areas were considered to be the most stable habitat present on the site, as the inland areas have been used for pine forestry and farming and were cleared fairly recently (2013 – 2018). And so, we focused our attention on the areas considered most likely to hold a lizard population.

Finally, the Applicant has not proposed how to address adverse effects on the potential native lizard population.

Response.

It remains highly unlikely that there are lizard populations of conservation concern in the areas being affected by the proposal and therefore no management regime has been recommended. We do not consider that normal salvage, even for northern grass skink, will be required at this site. Although we consider it unnecessary, we can discuss proposed conditions to alleviate any residual concern around native lizard management. There are some very practical ways of managing woody vegetation removal that can be employed if Horizons deem a response is necessary with an effect of very low probability.

11. Please provide a more comprehensive assessment on both the hydrological and nutrient effects associated with the running of the golf course within proximity to 2 to 3 natural wetlands. Specifically, a further understanding on if the wetlands can tolerate additional nutrient input expected of a golf course and address the hydrological effects of both altering the soil composition within proximity of a natural wetland and the increased water discharge within the proximity of a natural wetland.

Response:

A section was contained in the AEE. While this is an issue for the golf course management as to how they proposed to manage their turfs, the raupo wetland pocket is best described as a swamp (Johnson and Gerbeaux 2004[2]) and the vegetation components (mostly raupo) are very able to manage high nutrient loading (e.g. Pegman & Ogden 2005[3], Vymazal 2011[4]) Raupo has high decomposition rates (3kg/m^2/year) and high biomass production rates enabling it to utilise high nutrient loading.

We understand that fairway management should not cause additional nutrient leachate. However, we note also that current farm practices in relation to nutrient addition will cease and the inputs related to the raupo wetland may actually balance. We also understand Mr Allan on behalf of Grenadier will be addressing this potential issue.

In respect to the salt marsh wetland, this feature is some distance from any fairway or green (a very small back green of one hole is near) and therefore there will be a substantive non-fertilised area between it and those activities; and in a predominantly sand substrate soils leachate of that distance is highly unlikely. Again, the Applicant is proposing rehabilitation planting at the buffer of this area to remove the past exotic forestry influence and the current agricultural use of the land. From an ecological perspective this is considered a positive resulting from the proposal on the salt marsh. We note the northern margin of the salt marsh has emerging gorse, pampus and rank exotic grass invading the area.

12. Please provide a more quantitative assessment, using a peer reviewed methodology, of offsetting or compensating the permanent loss of rare and threatened ecosystems.

Response:

[2] Johnson, P.; Gerbeaux, P. 2004. Wetland types in New Zealand. Department of Conservation. ISBN: 0-478-22604-7.
[3] New Zealand Journal of Botany, 2005, Vol. 43: 779–789
[4] Hydrobiologia (2011) 674:133–156

Does the reviewer refer to those areas identified as Hole 14 foredune, and the three longitudinal dune system holes 17, 4 and 16 within which are the schedule F areas of Knobbly club rushland? We note in terms of Hole three and the kanuka, the significant kanuka is not being affected.

In terms of Hole 14 and being in the foredune, the report points out the issues with the holes intrusion but has sort to ensure that the hole has no impact on the spinifex community and the current layout only removes sands, lupin and gorse. These are not technically the vegetation communities of schedule F, but we did not micro-map out the various small exotic areas. We do not see offset requirement for this effect. Dr Boffa and Mr Dahm have recommended changes in the location of hole 14 (see the Land Matters Plan) that largely avoid the issues referred to (area E on that plan).

In regard to the interspersed Knobbly club rush with weed species in the hind dunes which is shown under some of the golf course; the effect was calculated as 1.7% of the local habitat affected (low) and the 11% of that on site (1.1 ha of clearance). The value of the community was rated as low (where there was no sand Daphne) and the loss of this edge 1.1 ha does not diminish the contextual value of the wider community or its representativeness. Much of the area to be affected is fragmented amongst exotic native weed mix. It is essentially a monoculture of knobby club rush interspersed with weed specifies.

We do not consider it necessary to develop a standard offset model as per (Business and Biodiversity Offsets Programme (BBOP) 2009; Maseyk et al. 2017; 2015) but that a sensible and effects proportionate approach is sufficient.

In this case 1.1 ha of moderate value simple interspersed knobby club rush hind dune is being lost to golf course fairway. Sufficient remains to be functional and self-sustaining. The draft restoration plan proposed by the Applicant and developed by the project landscape experts (Boffa, Oliver and RBT), with ecological input (Dahm and Boffa Miskell), shows substantive area of native coastal assemblage revegetation which replaces the 1.1 ha with 12.6ha. A ratio of 11.5-gain : 1-loss which would be more than a standard offset model. Our report was based on that approach and consistent with the approach promoted by Grenadier which is to fit the course into the important values of the site, and not the other way around.

While we do not consider a standard model is necessary (given the approach of the Applicant), we note that recently at projects in the lower North Island (McKays to Pekapeka and Transmission Gully and summer set retirement village Waikanae) the “offset” ratios for simple and early seral assemblage losses have been in the order of 1:1 and 1.5:1 and 2:1. These were offset modelled out comes. We consider this simple system of modified hind dune should be a 1:1 offset ratio, especially where the offset is more representative hind dune native revegetation (such as is proposed).

13. Please provide further information on the potential for bats occurring within vegetation likely to be removed as a result of the proposed golf course holes.

The Peka Peka to Otaki NZTA Opus report (2011) noted that the long-tailed bat *Chalinolobus tuberculatus* is known to inhabit Kapiti Island and the Tararua Forest Park. It is true that there are records of long tail bat sightings on Kapiti island, but curiously no specimens have ever been collected. DoC has also translocated 20 short tail bat pups to Kapiti Island.

No bat surveys have, to our knowledge, ever been undertaken along the coastal dunelands of the Kapiti and Horowhenua coasts. Duneland’s were not historically part of the native (long or short tailed) bats home range (in the absence of forest). They may have flown the riparian vegetation of the Ohau seasonally with emergence of flighted larger insects – but this forest is no longer present. There has been no large forest ecosystems in the coastal lands of the area for over 200 years (only a few small remnants see Foxton PNAP (Ravine 1992[5])) and it is unlikely any remnant bat population remain in the highly modified and predated

[5] Ravine, D. A. (1992). Foxton Ecological District: Survey report for the Protected Natural Areas Programme (New Zealand Protected Natural Areas Programme No. 19). Wanganui: Department of Conservation.

rural landscape or visit the various coastal macrocarpa trees that are, at most on site, 70 years old as night roosts form the forested hills of the Tararua Forest Park.

The distribution figures in M. J. Daniel 9 1 and G. R. Williams 1984. New Zealand journal of ecology 7: 9-25 shows Kapiti Island and Tararua forest records, no coastal levin - Ohau records.

Despite growing evidence of bats using farmlands and shelter belts in Waikato as more acoustic monitoring is undertaken, it remains highly improbable that the coastal macrocarpa shelterbelts and random trees offer bat roosts on this property in the absence of resources or nearby forest areas suitable to a population.

If there is insistence around this issue, then we recommend that the common practice of pre felling roost detection be undertaken to ensure no roosted bats are in residence at felling.

14. Please provide further information that demonstrates that the location of hole 4 and 17 will not result in the loss of the dominate cluster of sand daphne within the site.

Response:

The maps in the AEE appendix show the sand daphne that were located in the botanic survey. The vegetation map and golf layout overlay attached to this response illustrates this more clearly.

No other clusters or single species were observed in the areas proposed to be golf course as the botanic team searched extensively to ensure all of these taxa were located relevant to the proposed greens, Tees and fairways that intersected the dunes.

15. Please update the ecological assessment to factor in the potential ecological value of all freshwater features and assess the effects against the potential values, as directed by the NPS FM 2020.

Response:

We are unsure what this relates to. The Ecological assessment has undertaken the evaluation all of the freshwater wetland and the salt marsh features on site and provided an assessment and outcome of value. It also addressed the significance of the Ohau River and its values. The effects assessment considers the wetlands (in line with the NPS FM (2020), finding (with the avoidance recommended) an absence of direct effects (and no indirect effects are considered likely – see the nutrient response above and the response under point 16).

We note in the effects assessment that there are no perennial flowing streams in the proposed activity area, and we record that the risk of earthwork related sediment discharge to the Ohau River is unlikely – no effect.

Mr Allen on behalf of Grenadier has assessed the other potential issues as it relates to the Golf Course management especially during construction. We understand the project hydrogeologist has also assessed potential effects on surface water features.

16. Please provide further information that clearly demonstrates the removal and replace of more moisture retentive soils within proximity of all-natural wetland will not result in the partial drainage of the natural wetlands.

Response:

There is only one freshwater wetland, the circular “pit” containing raupo. The feature has no topographic features supplying surface flow or discharge. We are certain it is ground water fed. The base of the feature is between 400 and 500mm deeper set that the surrounding lands. Activity that might impact the top 400m (such as new more moisture hungry turf) are unlikely to influence the ground water level (450mm below the surface) at the base of the wetland.

Notable plant
- Kanuka
- Sand daphne
- Schedule F Vegetation

Course design
- Golf Fairways
- Building Outline

Vegetation communities
- 1,Grazed grassland
- 2,Rank grassland
- 3a,Mixed wattle treeland
- 3b,Mixed pine treeland
- 4a,Poplar treeland
- 4b,Poplar treeland over exotic scrub
- 5,Macrocarpa
- 6a,Exotic scrub
- 6b,Exotic scrub under pine
- 7,Exotic native mix
- 8a,Kanuka treeland
- 8b,Thin kanuka treeland
- 9,Knobby clubrush stable duneland
- 10,Spinifex active duneland
- 11,Wetland
- 12,Saltmarsh

Boffa Miskell

www.boffamiskell.co.nz

0 100 m

1:5,000 @ A3

Data Sources: BML, Sourced from the LINZ Data Service and licensed for re-use under the Creative Commons Attribution 4.0 New Zealand licence , Land Matters

Projection: NZGD 2000 Wanganui Circuit

DOUGLAS LINKS OHAU

Schedule F Vegetation and course

Date: 13 September 2021 | Revision: 1

Plan prepared for Landmatters Limited by Boffa Miskell Limited

Project Manager: Vaughan.Keesing@boffamiskell.co.nz | Drawn: MBr | Checked: HHu

Map 2a

Assessment of the proposed earthworks and irrigation activities against the relevant objectives and policies of the National Policy Statement for Freshwater Management 2020

The following assessment of the proposed earthworks and irrigation activities against the relevant objectives and policies of the National Policy Statement for Freshwater Management 2020 is informed by the information provided by the relevant technical experts who have assessed the proposal on behalf of the Applicant.

Objective 1
The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises: a. *first, the health and well-being of water bodies and freshwater ecosystems* b. *second, the health needs of people (such as drinking water)* c. *(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.*
Policies
***Policy 2:** Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for.*
Comments As part of the development process, the Applicant has consulted with Ngāti Kikopiri who have mana whenua over the land. The Applicant understands from the consultation and the Cultural Values Assessment, conveyed to the Applicant by Ngāti Kikopiri, that there is an inter-related nature between a number of groups in the area and the Applicant intends to continue to consult with, and discuss opportunities for, iwi throughout the development of the proposed activity. The Memorandum of Understanding (**MoU**) between the Applicant and Ngāti Kikopiri provides for this ongoing consultation. The Applicant is keen to continue to involve tangata whenua in the development of the land and water in a way that identifies and provides for their values.
***Policy 6:** There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.*
Comments As stated in the information provided by the Head of Construction for the proposed golf course: *The additional information request indicates a potential concern around the potential for drainage of natural wetlands. I believe the possibility of natural wetland drainage as a result of the golf course to be almost nonexistent.* *The native sandy soils on the site are very well suited to producing high quality firm and bouncy Fescue playing surfaces, and a key reason Grenadier Ltd is attracted to the site. Links golf courses are meant to be firm and dry. Sandy soils provide the free draining characteristics ideal for the construction of golf courses. Indeed, sand is frequently imported into golf courses to build greens and tees on and to be used as a topdressing medium to firm up surfaces. Grenadier will want to maintain wetland features to enhance*

the appeal of the wider golf landscape. Unlike the farms in the surrounding area there is no advantage to capturing moisture retentive soils to create 'productive' land.

There will be no topsoil imported to site. Grenadier will be exclusively using the existing sands from the site and from the immediate surrounds of each specific zone. There should be no noticeable or measurable change in moisture retention. There are no upsides to Grenadier moving more moisture retentive soils into the areas meant for golf turf. Again, moisture retaining soils mean softer surfaces which lead to poorer playing conditions, extra growth to mow, and invasion of weed species grasses such as Poa Annua. Lower moisture soils encourage deeper root systems which can access natural rainfall and nutrients at depth better and leads to healthier grass requiring less fungicide and fertiliser.

Grenadier will not be contouring to lead water away from the wetland.

Additionally, the water level in the wetland is likely determined more by the level of the water table rather than runoff or seepage from surrounding soils.

To meet the summer survival and health requirements of the Fescue turfgrass, Grenadier would potentially apply approximately 300mm of irrigation in the summer months when natural rainfall isn't frequent. I suspect that irrigation in the absence of rainfall would be more likely to enhance any wetland than detract from it, although the effect would be small enough to not be able to be measurable.

As stated in the information provided by Boffa Miskell in the attached memo:

…the raupo wetland pocket is best described as a swamp (Johnson and Gerbeaux 2004[1]) and the vegetation components (mostly raupo) are very able to manage high nutrient loading (e.g. Pegman & Ogden 2005[2], Vymazal 2011[3]) Raupo has high decomposition rates (3kg/m^2/year) and high biomass production rates enabling it to utilise high nutrient loading.

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In respect to the salt marsh wetland, this feature is some distance from any fairway or green (a very small back green of one hole is near) and therefore there will be a substantive non-fertilised area between it and those activities; and in a predominantly sand substrate soils leachate of that distance is highly unlikely. Again, the Applicant is proposing rehabilitation planting at the buffer of this area to remove the past exotic forestry influence and the current agricultural use of the land. From an ecological perspective this is considered a positive resulting from the proposal on the salt marsh. We note the northern margin of the salt marsh has emerging gorse, pampus and rank exotic grass invading the area.

Based on the above, it is our view that the design of the golf course, including iterative design process and the construction and operation procedures designed to protect the natural wetlands on the property, we consider the proposal is consistent with Policy 6.

[1] Johnson, P.; Gerbeaux, P. 2004. Wetland types in New Zealand. Department of Conservation. ISBN: 0-478-22604-7.
[2] New Zealand Journal of Botany, 2005, Vol. 43: 779–789
[3] Hydrobiologia (2011) 674:133–156

Policy 13: *The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.*
Comments As part of the on-going golf course management regime, the valued features on the property, including fresh- and salt-water wetlands and other significant habitats on the property, will be monitored and, if required, management changes will be implemented to ensure those features are protected throughout the life of the project.
Policy 15: *Communities are enabled to provide for their social, economic, and cultural well-being in a way that is consistent with this National Policy Statement.*
Comments The proposed activity has been demonstrated to be consistent with the NPS-FM and will enable the use of the property in a way that provides for the social, economic and cultural well-being of the local and wider communities.

7 December 2021

Fiona Morton
Senior Consultant Planner
Horizons Regional Council
Private Bag 11025
Manawatū Mail Centre
PALMERSTON NORTH 4442

fiona.morton@horizons.govt.nz

Dear Fiona

Application APP-2020203164.01 – Grenadier Limited, 765 Muhunoa West Road, Ōhau

We refer to previous correspondence requesting clarification of ecological information and further iwi consultation and archaeological input for the above application.

Please find attached the further information agreed at the meeting between the Applicant's ecologist, coastal geomorphologist and hydrogeologist and Horizon Regional Council's (**HRC**) ecological consultant of 2 November 2021.

We enclose:

- Boffa Miskell memorandum dated 22 November 2021 providing details of (a) vegetation plots and (b) detailed katipo spider searches in specified areas;
- Joint memorandum dated 2 December from Boffa Miskell ecologists and the golf course construction manager relating to the potential effect of nutrient enriched water into identified wetlands; and
- Bay Geological Service Limited letter dated 2 December 2021 providing data and assessment of the hydraulic gradient across the project area.

In relation to the agreed skink survey work, we understand the project ecologist, Dr Keesing of Boffa Miskell, will report directly to HRC's consultant ecologist on the findings of those surveys once complete.

We have been in touch with the project archaeologist (Mary O'Keefe). Mary has considered your letter and provided her opinion that it is important to seek an archaeological authority when the conditions of resource consent are known. The archaeological report has been written in an integrated way covering both RMA and Heritage NZ legislation.

The Applicant's cultural advisor has been in touch with Mr Fryer and the applicant has made significant efforts in further iwi consultation, including engaging with the parties listed in your letter dated 29 October 2021. This consultation is on-going and we will report on the results of this once further meetings have been conducted.

We trust the attached information resolves the relevant outstanding issues and will provide the residual information (relating to iwi consultation and the agreed skink survey) in due course.

Yours sincerely

LAND MATTERS LIMITED

Tom Bland
Senior Planner
Tel: 021 877 894
Email: tom@landmatters.nz

Boffa Miskell

Memorandum

☐ **Auckland**
PO Box 91250, 1142
+64 9 358 2526

☐ **Hamilton**
PO Box 1094, 3240
+64 7 960 0006

☐ **Tauranga**
PO Box 13373, 3141
+64 7 571 5511

☑ **Wellington**
Level 4
Huddart Parker Building
1 Post Office Square
PO Box 11340, 6142
+64 4 385 9315

☐ **Christchurch**
PO Box 110, 8140
+64 3 366 8891

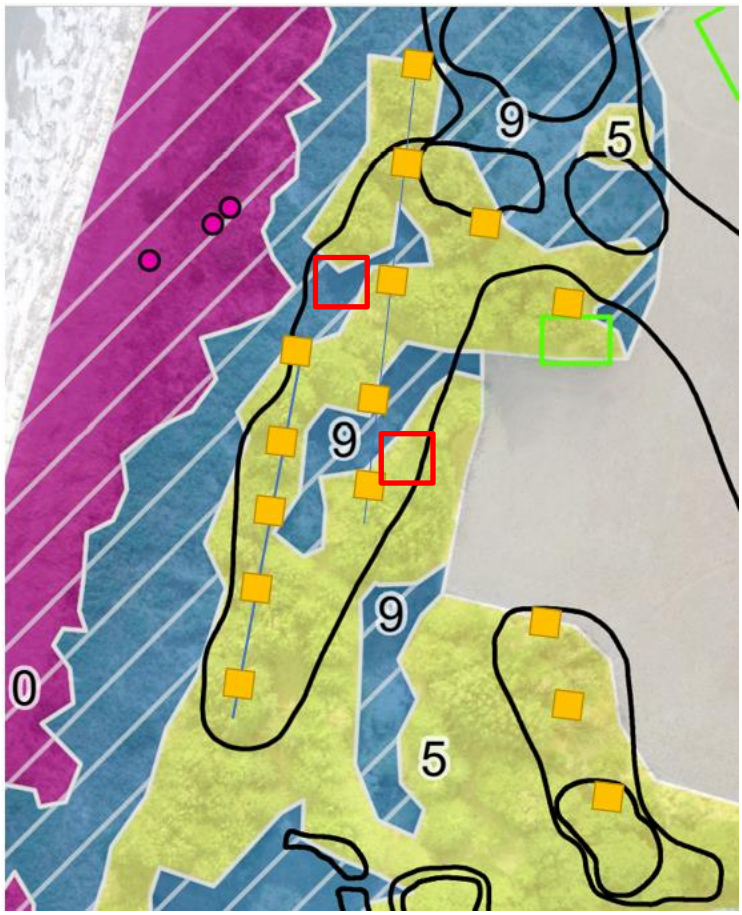
☐ **Queenstown**
PO Box 1028, 9348
+64 3 441 1670

☐ **Dunedin**
PO Box 657, 9054
+64 3 470 0460

Attention:	Bryce Holmes – For Grenadier Limited
Company:	Grenadier Limited – C/- Land Matters Limited
Date:	22.11.2021
From:	Dr Vaughan Keesing

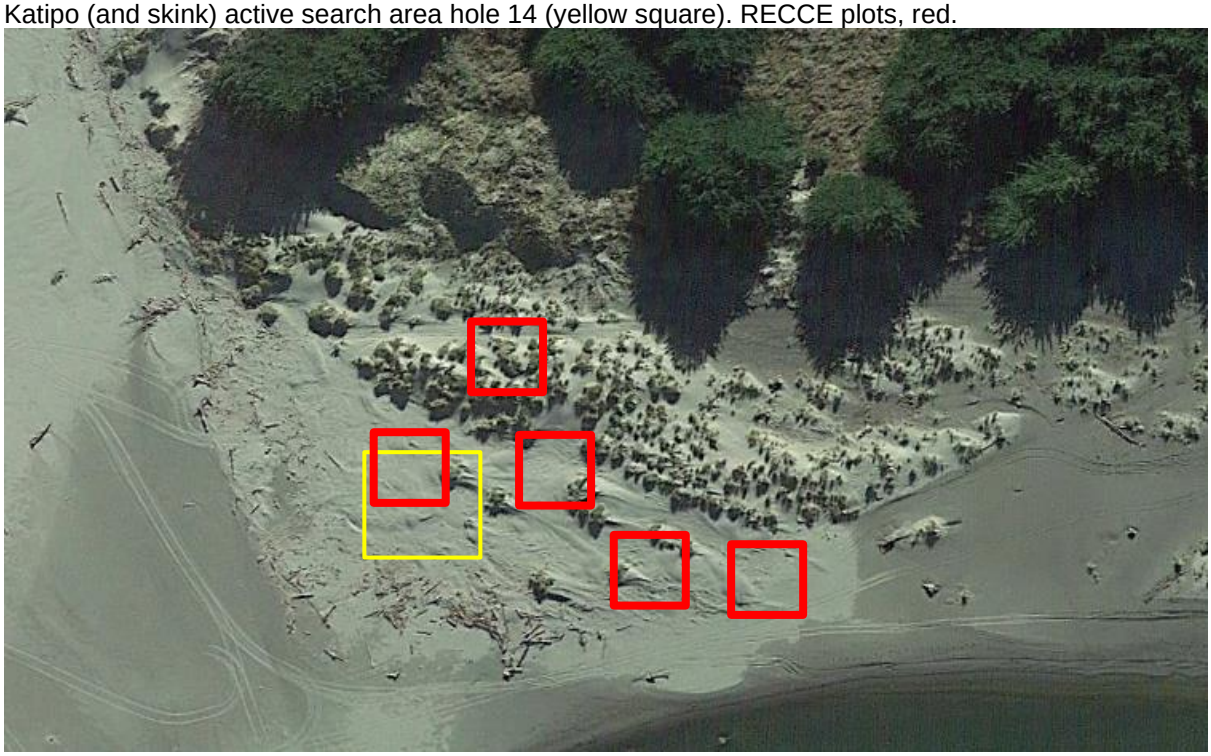
This memorandum has been prepared for the benefit of the project team and technical reviewers for the ecological information for activities involved with the Douglas Links Golf Course proposal. It has been provided to build on and add to the knowledge base in our earlier reports and also the Horizons site visit report following an inspection in June 2020. That Horizons report helpfully mapped general areas (desktop mapping) that may be considered Schedule F areas. The report noted the assessment was not comprehensive and, because the mapping was desktop, the reviewer has asked that specific data be collected by plot so that the schedule F mapping is more specific. This memorandum provides further data and builds upon earlier reports by Horizons and Boffa Miskell.

In discussion regarding the various reports and data on specific areas of the AEE, and in regard to schedule F boundary and ecological values for the proposed Ohua golf course, there was an agreement during our last constructive meeting with Horizons ecological reviewer that 15 vegetation 10mX10m RECCE plots would be undertaken in areas of Council reviewer's concern in regard to the BML's schedule F (horizons one plan) boundary (which was noted then as a precautionary line). And in terms of the presence of katipo in the knobbly rush and hole 14 "active" dune areas. These areas were to receive detailed searches (20m by 20m areas at three locations - two in hole 17 area and one in hole 14 area). The agreed work was laid out in the following maps:



Orange squares represent RECCE plots, red squares katipo searches.

Katipo (and skink) active search area hole 14 (yellow square). RECCE plots, red.



The above photo does not represent the current vegetation and the plots the proposed golf extent – The following is a better determination of area involved in the search and the proposed hole 14 area.

The following map shows the actual survey undertaken at hole 14.

Survey and Results

On the 18th November 2021 during fine weather, two BML ecologists went on site and undertook the agreed katipo searches and RECCE plots in the agreed areas. They used ARCGIS maps and ipads with GPS capabilities to ensure they were searching and undertaking plots in the correct areas. Photos were taken to visually show results.

Hole 14

Hole 14 was initially and precautiously mapped as “active dune” because at the scale of mapping undertaken. The edge of the proposed hole however, was initially reduced and moved inland purposefully to avoid the active sand and spinifex areas. What was not evident on the mapping is that the areas actually involved were weed dune slacks. Plots 1-5 (Table 1) represent the vegetation cover of the proposed hole. All of the plots (and indeed the area as a whole) is dominated by lupin over hairtail. The proportion of native plant cover is Ca 1% and there are plentiful weed species. The vegetation bears no resemblance to the predominantly native foredune further out. Photo 1 illustrates the lupin and the boundary of the hole proposed. There is also a modicum of rubbish present in the form of an old couch, bottles and Styrofoam boxes etc in the lupin.

The two 20mX20m grid fauna searches were undertaken and involved searching between 40 and 60 specific habitat cover items (driftwood and human refuge) and 40 lupin basal stems in each grid. No katipo were found in the affected area but two katipo were found in drift wood outside the area adjacent to an old stove and other rubbish to the east. These areas are not subject to any proposed activities and will be unaffected by the proposal. We note their presence for completeness.

Figure 1. Hole 14 encompasses only the lupin and hairs tail area adjacent to the macrocarpa canopy.

Figure 2. The comparison between the active dune and natural vegetation and the back hollow full of lupin.

From these data, we are able to more accurately map the vegetation and have taken this opportunity to do so as a section 92 response and this vegetation map supersedes the AEE map. The vegetation is not active dune but 6a exotic scrub (lupin).

This area has negligible to low ecological value with limited habitat value and no indications of any at risk or threatened species. The grid searches did not uncover any skink species or katipo despite the season and weather being conducive for active searching to uncover any.

The entire loss of this small area given the extent of similar exotic shrub and shrub site wide can be viewed as a low magnitude of effect to a low or negligible value habitat resulting (EIANZ 2018) in a very low level of effect - or a much less than minor effect.

Hole 15

This short hole was shown to be in type 5, macrocarpa (as a tall and expansive canopy), and the reviewer voiced a concern about a lack of evidence as to the under story in this community. The plot data was requested to factually determine any Schedule F values and areas.

The AEE stated that the under tier was: "*The groundcover was largely bare, open ground with dropped branches and leaf litter from the macrocarpas, otherwise very sparse.* " - "*Under the canopy very little vegetation was present, with no subcanopy species and varying degrees of cover from New Zealand spinach, more prominent toward the dunes, occasional diversity of Asplenium sp. (A. appendiculatum, A. flabellifolium, A. flaccidum, A. oblongifolium, and A. polyodon), low Coprosma repens, houndstongue (Microsorum pustulatum), Paesia scaberula, Glen Murray tussock* [*Carex flagllifera*]*, and shaking brake (Pteris tremula) were present, rarely scattered throughout, more condensed toward light edges*." and,

"*Where macrocarpa met the margins of grassland, there were pockets of silver poplar over rank grass and gorse, with occasional kānuka seedlings, lucerne, tree lupin, and pampas grass. Where macrocarpa met stable duneland communities, native spinach, knobby clubrush, lupin, Gazania sp. and Arctois stoechadifolia were present. The community is growing on duneland sands but is almost entirely exotic*".

The plots 6-9 (Table 1) undertaken in the area show the accuracy of the AEE (i.e. very accurate). The great majority of macrocarpa and pine canopy areas are largely barren underneath with occasional ferns and very sparse beach spinach. While the spinach is an “At risk” naturally uncommon (EF, SO, Sp) (extreme fluctuations, secure overseas and sparse) species ,under the EIANZ protocol a species with an at risk status other than declining has a “moderate value” – despite the spareness of the spinach under the 90-100% cover of the macrocarpa (and the only reason it is on site is the canopy cover) this moderate value does not raise the habitat value above low.

The data in the AEE and now in plots 6-9 reinforces that this area cannot be identified as a Schedule F area.

Figure 3 Under pine and macrocarpa canopy, little vegetation in the ground and middle tiers.

.0 

Figure 4. A small are of hounds tongue under the dense pine canopy.

Figure 5. A slight canopy opening allows boarder panic grass and flat weeds and occasional shining spleenwort and hanging spleenwort and hounds tongue fern.

While on site (at both hole 15 and 17) we also undertook some plots in the ”Type 9” blue areas of the initial vegetation map, called knobbly club rush areas. We did this because it was clear that the initially assessment areas had been done so on a precautionary basis and had tried to reflect to a degree in favour of the native back dune components. With plot data it became very evident that in many areas knobbly club rush was not a prominent component of much of these dune hollows between macrocarpa covered dune

ridges. Some areas were almost exclusively exotic grass and lupin. Plots 9, 11, 13, 15 show the vegetation cover of these inter ridge hollows. Using the 20/50 dominance protocol these communities are best described as exotic grasses and lupin and only the community of plot 17 (80% knobbly club rush) is in fact the valued back dune native rush community). Plot 13 represents a knobby club rush lupin pasture mix.

Figure 6. A lotus/ Yorkshire fog dune hollow (Plot taken here)

Hole 17

This longer area of macrocarpa and pine with dune hollow areas of “knobbly club rush” is described in the AEE accurately and again here by plots 10-17. The macrocarpa ridges are accurately described and as Hole 15 are largely bare ground or heavy pine needles and occasional a small carpet of hounds tongue and sparse beach spinach. As Hole 15 we have adjusted the mapped vegetation to take better account of the plot data results. This has resulted in removing several of the small dune hollow “knobbly rush” areas which are better reflected by exotic grasses, lupin, blackwood, Pampas etc.

Two 20m by 20m grids were searched, one in community type 5 and one in type “9”. There was no habitat opportunity in type 5 (under macrocarpa). There was very little to no woody debris or other refugia and searching was a crawl through the grasses and lupin searching bases of tussock grasses and lupin. The community 9 search took 1 hour. There was no sign of katipo or lizards.

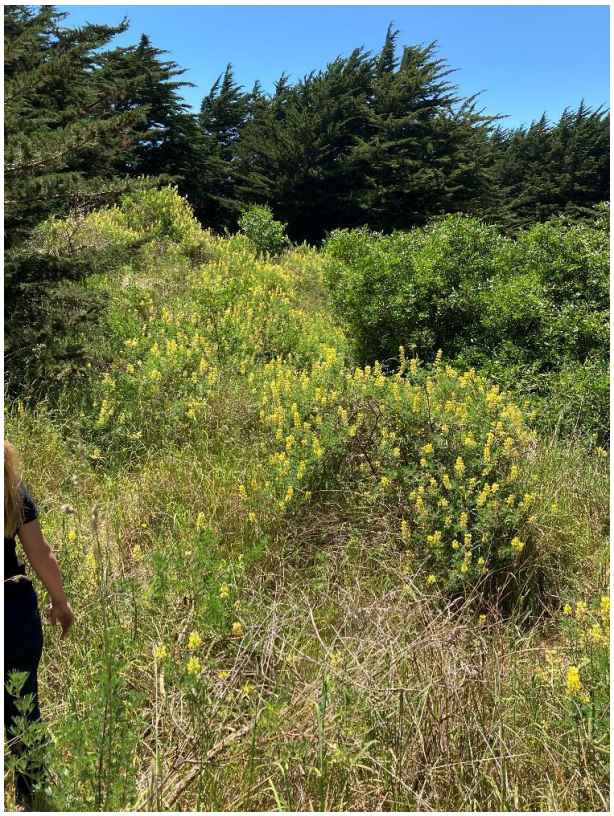


Figure 7. Initially referred to as knobbly rush but actually dominated by lupin and exotic grasses

Figure 8. Occasional beach spinach under macrocarpa and bare spoils

Figure 9. Initially referred to as knobbly rush dune hollows but actually mostly exotic grasses and lupin

Figure 10 Typical cover under the dominant macrocarpa/pine campy for much the dune ridges.

Figure 11. A rare Hounds tongue cover under macrocarpa.

Figure 11. Knobby rush dune hollow

Table 1 RECCE plot data

				Hole 14 -active dune area					Hole 5				Hole 17							
Plant taxa in plots		Conservation status	exotic/native	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
beach spinach	Tetragonia tetragonoides	At Risk – Naturally Uncommon	N							3			1		5					
blackwood			E											2		5				
cocksfoot			E											40		10		5		10
Cleavers			E													1				
crested dogs tail			E											20				1		
dandelion			E	10	5	10	5	2		2				2		5		3		1
fleabane	Conzya sumattensis		E	2	1	1	1	1		1										
hairs tail			E	20	40	20	30	20		1						5				
hanging spleenwort			N						1	2								2		
hawkebit			E	1	1	1	1	1												
hounds tongue fern			N						3	10				1				60		80
knobbly club rush			N	0	1	5	2	1		1						30		5		
lotus			E	1	0	0	0	0				70								
lupin			E	40	60	70	70	70				1		30		20				10
macrocarpa			E						90	95	95	0	100		100					
marram grass			E	5	0	1	1	1												
moss			N											10						
night shade	Solanum chenopdioides		E	0	1	0	0	0		1										
pampas			E	0	1	0	0	0												
pine			E				10													
pohuehue	mue complexa		N											1						
purple groundsel	Senecio elegans		E	3	0	1	1	1		1										
radiata pine			E																	

ragwort			E							2										
Rautahi	Carex geminata		N									1								
sand bindweed			N	1																
Glen Murray tussock	Carex flagellifrea		N																	
shining spleenwort			N						2					1				10		
silver poplar			E						1											
boarder panic grass	Entolasia marginata		E							10								5		
tall fecue			E	0	0	0	5	0				5				15				
tall oat grass			E	0	0	0	0	1						2						
taupata			N																	
vetch			E															1		
Yorkshire fog			E									40								
bare unvegetated surface				17				2	94	66	100		99		95	10	100	10	100	
			cover sum	100	110	109	126	100	101	100	100	117	100	109	100	101	100	102	100	101
			proportion native (%)	1	1	5	1.6	1.0		47		1	1	12	5	33		75		79
			proportion exotic (%)	99	99	95	98.4	99		53		99	99	88		67		25		30
			cover canopy	0	0	0	0	0	90	95	95	0	100	0	100	0	100	55	100	0

Table 2 Dominant vegetation cover descriptions

Plot numbers	1-5	6-8	9	10	11	12	13	14	15	16	17
20/50 plot dominance	lupin/hairs tail	bare ground	Lotus/ Yorkshire fog	bare ground	cocksfoot/lupin/crested dogs tail	bare ground	knobbly club rush/lupin	bare ground	hounds tongue fern	bare ground	knobbly club rush

Out comes and conclusions

Community 5 was presented well in the AEE and is not representative in canopy or middle or ground tier of the expected native dune ridge and dune hollow communities. This is unsurprising given the extensive long-term levels of modification. These areas do not fit schedule F criteria for while they have the geo-morphology of dune and dune hollow, they do not have the appropriate native vegetation of those communities, and are and will continued to be outside of the schedule F boundary. Furthermore, the plot and photo data show that the areas within the wider type 5 which were initially labelled type 9 knobbly club rush are not those but are actually exotic scrub and shrub and the map changes (Appendix 1) now reflect this. Hole 14, active dune area is now recognised by plots as exotic scrub (lupin) and has virtually no representativeness value and is properly reflected in the mapping (Appendix 1) and a new assessment of effect is presented which is an overall level of very low. No katipo were found in area 14 or the wider grid searches in other areas (katipo were found in wood debris outside of the subject area).

No lizards were found or seen and it remains strongly the observation that the heavy mouse and hedgehog populations observed in the critapics as well as the history of site modification, and absence in any in the initial survey method undertaken, is because there are only very low populations of northern grass skink and no other taxa. This presence (northern grass skink) in low abundance does not result in a value change from that already expressed, what it does is cause a need through the wildlife act to salvage these lizards if their habitat is to be sufficiently disturbed.

The impacts of the golf course as proposed are less than minor the level of effect on all communities affected is very low.

Appendix 2 overlays the new vegetation map and plots with the proposed restoration efforts it can be seen here (and in response to the reviewer’s question) that the restoration is in in largely exotic low value communities and not in any valued indigenous dominated areas. This ensures the outcomes of the restoration are truly site beneficial and progressing communities that otherwise have not and would not gain additional indigenous dominance or habitat value.

Notable plant
- Kanuka
- Sand daphne

Course design
- Golf Fairways
- Building Outline

Vegetation communities
- 1,Grazed grassland
- 10,Spinifex active duneland
- 11,Wetland
- 12,Saltmarsh
- 2,Rank grassland
- 3a,Mixed wattle treeland
- 3b,Mixed pine treeland
- 4a,Poplar treeland
- 4b,Poplar treeland over exotic scrub
- 5,Macrocarpa
- 6a,Exotic scrub
- 6b,Exotic scrub under pine
- 7,Exotic native mix
- 8a,Kanuka treeland
- 8b,Thin kanuka treeland
- 9,Knobby clubrush stable duneland
- Katipo search area
- Vegetation plots

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0 100 m

1:5,000 @ A3

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Projection: NZGD 2000 Wanganui Circuit

DOUGLAS LINKS OHAU

Schedule F Vegetation and course

Date: 24 November 2021 | Revision: 1

Plan prepared for Landmatters Limited by Boffa Miskell Limited

Project Manager: Vaughan.Keesing@boffamiskell.co.nz | Drawn: KMa | Checked: VKe

Map 1

Notable plant
- Kanuka
- Sand daphne

STABLE DUNE BUFFER REVEGETATION

ACTIVE FOREDUNE MANAGEMENT

SALT MARSH AND WETLAND MANAGEMENT

COASTAL DUNE SHRUBLAND AND TREELAND

- Katipo search area
- Vegetation plots
- Golf Fairways
- Building Outline

Vegetation communities
- 1,Grazed grassland
- 2,Rank grassland
- 3a,Mixed wattle treeland
- 3b,Mixed pine treeland
- 4a,Poplar treeland
- 4b,Poplar treeland over exotic scrub
- 5,Macrocarpa
- 6a,Exotic scrub
- 6b,Exotic scrub under pine
- 7,Exotic native mix
- 8a,Kanuka treeland
- 8b,Thin kanuka treeland
- 9,Knobby clubrush stable duneland
- 10,Spinifex active duneland
- 11,Wetland
- 12,Saltmarsh

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0 100 m

1:5,000 @ A3

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Projection: NZGD 2000 Wanganui Circuit

DOUGLAS LINKS OHAU

Proposed restoration overlay

Date: 24 November 2021 | Revision: 1

Plan prepared for Landmatters Limited by Boffa Miskell Limited

Project Manager: Vaughan.Keesing@boffamiskell.co.nz | Drawn: MBr | Checked: HHu

Map 2

Boffa Miskell

Memorandum

☐ **Auckland**
PO Box 91250, 1142
+64 9 358 2526

☐ **Hamilton**
PO Box 1094, 3240
+64 7 960 0006

☐ **Tauranga**
PO Box 13373, 3141
+64 7 571 5511

☑ **Wellington**
Level 4
Huddart Parker Building
1 Post Office Square
PO Box 11340, 6142
+64 4 385 9315

☐ **Christchurch**
PO Box 110, 8140
+64 3 366 8891

☐ **Queenstown**
PO Box 1028, 9348
+64 3 441 1670

☐ **Dunedin**
PO Box 657, 9054
+64 3 470 0460

Attention:	Bryce Holmes
Company:	Grenadier Limited – C/- Land Matters
Date:	2.12.2021
From:	Dr Vaughan Keesing & Mr Brendan Allen
Message Ref:	Ohau, Golf course water nutrient and wetlands

Dear Sir

We are aware of a reviewer question (BECA: Mr Whiteley) related to the potential for the golf course turf management to release nutrient enriched water into either the small raupo “pot” wetland or the Ohau river edge saltmarsh. In the first instance we responded verbally during a workshop that that probability was extremely low given the golf courses removal of the existing farm pasture management in regard to fertiliser, but also given the types of wetland present and the buffer distance from aerial or surface discharge, any such effect was highly unlikely.

We follow that verbal assurance with this memorandum.

Mr Allen, who has Horticulture and Amenity Turf Management qualifications and 25+ years of practical experience, has considered the golf course greens and fairways he will build and how they will be managed.

He relates that the topography of the course and the prevailing winds are a factor in the potential for loss of nutrient to non-target areas (wetlands) - as well as construction sediment (sand) loss. The latter he relates is standard and simple to mitigate and it is only windblown material that may be of concern to the salt marsh given the buffer of land between the feature and activity. He relates that the type and quantity and delivery system of fertiliser is an important factor in terms of the risk of loss of nutrient from its intended destination. He reminds that the economics of wasting nutrient (fertiliser), if it was to be lost from its intended target vegetation, is a consideration. Mr Allen also reminds us that the application of fertiliser under the golf regime only affects 30ha (tees, greens and fairways) not the entire farm area and so much of the land will no longer receive fertiliser. In short the quantities of fertiliser used and the methods of use in golf course management, as compared to the old farm system, means a likely reduction in non-target nutrient spread and quantity.

In essence the query seems to be about the potential for spray irrigated nutrient addition getting to and adversely affecting the two wetland features. Mr Allen is of the opinion that any runoff (from irrigation) will be minimal due to the sandy soils high infiltration and percolation rate (soil/sand hydraulic conductivity of 345-413mm/hr).

It should be remembered that the potential for an effect site wide is also more than balanced (positively) by the removal of grazing cattle and pastural management practices from the site. This will have a direct benefit to the raupo wetland where stock and wild animals can be seen to access and wallow and graze in it.

Mr Allen says that Grenadier’s golf construction team will use the sandy soils and contours with only minor contouring changes, so there will be no significant change in runoff direction or rate compared to the current situation (and little risk of “sediment” loss at construction).

Golf course management proposes to use Fescue grass varieties chosen for this links golf course which thrive under low moisture conditions. This means soil volumetric moisture percentages of less than 25%,

which leaves significant room for infiltration rather than runoff. Standard golf course maintenance practices such as coring, spiking, and vertidraining will be regularly used to maintain consistency of water infiltration to maximise turfgrass health. All this means the risk of run off or shallow ground water leaching to either wetland is virtually zero. This is further reinforced by the project hydrogeologists in their letter dated 2 December 2021.

During the summer low rainfall period Grenadier will be irrigating the turfgrass to keep it healthy and to a standard required to meet high player expectations. However, over irrigation to the point of runoff produces undesirable soft playing surfaces totally incompatible with links golf.

The Fescue grass variety to be used requires minimal fertilizer inputs to establish and maintain. A preliminary site soil test result from the NZ Sports Turf Institute via Hills Laboratories has shown sufficient existing levels of Calcium, Magnesium and Potassium to grow Fescue. Should Grenadier need to apply corrective fertiliser, this would take the form of stable granular fertilisers applied immediately prior to seeding and incorporated into the soil surface, making nutrient runoff extremely unlikely.

The authors note that excessive nutrient application to fescue grasses has a negative effect by creating an environment better suited to weed competition. Links grasses are fertilized only to maintain cover, not lushness or colour etc. Any excess growth would mean extra mowing – unlike a farming or cropping situation there is no commercial gain from dry matter production.

Phosphorus is generally considered the nutrient of greatest concern for wetlands. Fescues can be established with negligible levels of Phosphorus and maintained with almost none. It is highly likely that the conversion from farmland to golf course will see a significant reduction in the use of Phosphorus.

In short, the golf course management will result in less fertiliser additions of “better” fertiliser types applied in better ways than the historic farming management and thus cause no change in drainage pattern and probably less periodic artificially increased nutrient influxes to either wetland.

This discussion leads then to consideration of the sensitivity of the small raupo swamp pot and the Bolboschoenus/raupo saltmarsh.

As related in the AEE, the saltmarsh follows a gradient from the eastern upper edge with exotic scrub and rank pasture with flax, lupin, pampas, and gorse, and occasional cabbage trees. This provides a buffer in excess of 30m (vertical not land distance) from the fenced pasture which was pine forest several years ago and 25m from the nearest green/fairway. This edge graduates into rushland containing large swathes of raupō, *Bolboschoenus caldwellii*, threesquare, sea rush with lower proportions of oioi, marsh ribbonwood, *Schoenoplectus pungens*. This then grades into a low herbaceous more salt orientated assemblage. The feature is not intact and there are numerous drier pasture ingresses and edges of weeds etc, but as a whole the feature is one of the larger salt marshes in the district.

The hydrological drivers are the lower river terrace shallow ground water and the Ohau River (the supply of water) and the salt intrusion from tidal flows, as is evidenced by the species of plant and their distributions. Ms Johansen corroborates this view with her ground water flow direction report. Surface rains that fall on the sloped land from the pasture to the river do flow into the wetland and the profile (using Goole earth topology tool, Figure 1) shows a steady slope of around 4% from the pastural flats to the river. However, that water passes through a fully vegetated rank grass and weed land which at 20-30m is well in excess of stormwater management buffer filtration dimensions (length) (Auckland Regional Council 2003; Cunningham et al. 2017; Lewis et al. 2015; Auckland Council, n.d.). That is “clean” water only reaches the saltmarsh from the farmed land.

Figure 1. 2018 google image of the saltmarsh and Google topographical profile

Mr Allen does not predict a nutrient increase potential based on his expertise and proposed management of the golf course. But if there was what would be the response of the salt marsh?

Tanner (Tanner 1994, 1995) considered a range of wetland plants (Schoenoplectus and Bolboschoenus included) as species that might be capable of supplying water treatment, and so tolerant of, and able to make use of increased nutrient. These are plants found in the salt marsh.

Raupo, Schoenoplectus and Bolboschoenus are rapid biomass accumulators responding to changing nutrient availability seasonally and utilising available nutrient. If there was additional nutrient - and that appears very unlikely, the dominant raupo-Bolboschoenus community would “consume” it. Both these species appear to translocate seasonally their nutrient resource accumulated into the roots as their above ground green material “dies off” for winter. This makes them very competitive when spring returns. (Tanner 1995). Schoenoplectus also responds well with increased reed density the result.

If anything, an increase in nutrient into the majority of the wetland would favour Bolboschoenus and raupo dominance and Schoenoplectus presence over wet pasture and weeds (given the hydrology also present).

There are a number of publications of coastal salt marsh decline related to eutrophication (e.g. Deegan etal. 2012) but these north American examples relate to a single species (Spartina) whereby the nutrient causes the root-shoot ratio to greatly favour shoots and the result is plant loss (detachment) from lack of roots in mud channels affected by tidal flow leading to channel erosion and open water, not community change related to plant assemblage change.

Raupo freshwater wetland

The “pot” is surrounded entirely by pampas grass, lucerne, gorse, and coastal wattle. The interior is raupō (*Typha orientalis*) dominated, approximately 6 m x 6 m, with Isolepis (*Isolepis prolifera*) surrounding the raupō in a ~2m wide radius. One 2 x 2 m area of deep mud, which is open water during wet times, is entirely covered by *Lemna disperma*.

This three species natural wetland is an induced swamp in which three very tolerant, successful eutrophic oriented wetland species dominate. Raupo is well known to be “nutrient hungry” and will utilise high nutrient levels to accrue seasonally large biomass increases (Pegman & Ogden 2005). Isolepis is similar, rapidly increasing in biomass with nutrient availability (and the absence of stock) (Greenway & Lucus 2010). Simple wetlands of this nature are not sensitive and tolerate wide environmental conditions, but the prediction is that neither the amount or quality of water will appreciably change and if there is a nutrient change it will be a decrease rather than an increase.

Conclusion

The proposed golf course development and management will most likely result in a better water and fertiliser regime, more suited to the persistence of both wetlands through removal of stock grazing, management of weeds, removal of periodic ad hoc fertilisers, and better managed irrigation, all while being cognisant of those wetland features and the need to sustain their condition in a way standard farming does not.

We jointly consider any adverse effect on the Raupo freshwater wetland and saltmarsh as a result of nutrient change to be negligible. Conversely, and without taking a positive versus negative balancing approach, there will be substantial ecological benefits from the activities which are more akin to a ‘natural system’ on site when compared to the current use.

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Bay Geological Services Ltd
A C Johansen
RD6
Napier 4186

mobile: +64 275 014 984
email: *baygeological@xtra.co.nz*

2 December, 2021 ref: BGS258_02c

Grenadier Limited
c/- Tom Bland/Bryce Holmes
Land Matters Limited
20 Addington Road
RD1
Otaki 5541

Dear Tom and Bryce,

DOUGLAS LINKS APPLICATION FOR GROUNDWATER RESOURCES
765 MUHUNOA WEST ROAD, OHAU

Further to online discissions held with Horizons and the selected peer reviewers (Beca) with regard to the Douglas Links Application, a query was presented around the hydraulic gradient across the project area. To investigate this, a request was raised with Horizons Regional Council (Horizons) for groundwater bore static water level data (SWL) across greater Muhunoa West Road area. The information was provided; however less than half the recorded bores included a SWL, although the result of the SWL analysis did not have a dramatic influence on the outcome.

The council online GIS General Viewer map was also referred to in order to locate bores with available SWL data.

1. HYDROGEOLOGICAL SETTING

The volume of rainfall runoff in comparison to that entering a groundwater system is a function of the hydrogeological properties of the geological formations, primarily permeability and porosity of the near-surface strata. In low permeability strata, surface water runoff typically drains in directions aligned with the topographic gradient.

The surface geology at the coast is mapped as a series of Quaternary sand deposits form adjacent to the coastline (Begg and Johnston 2000, Morgenstern et al 2019). The Ohau drainage pattern is NE-SW, aligned with the tectonic structure of the area, with flow toward the northwest.

2. HYDRAULIC GRADIENT

A review of surrounding groundwater bores within close vicinity of the new Douglas Links Well was completed in order to study shallow bores' SWL and map the hydraulic gradient. A number of bores within 3 km of the Douglas Links well site was identified with the assistance of Horizons online map and data provided by the groundwater scientist. Of the thirty-nine wells mapped within a 3 km radius including the Pumped Well, seventeen bores record SWL's; however, nine wells are either flowing artesian or screened over a deep aquifer. Eight of the bores provide information on shallow unconfined water levels, and these are used to map the hydraulic gradient, taking into consideration site elevations, with the resulting measurement in metres above mean sea level (m amsl). A copy of the bore details is provided in Appendix A.

The spring SWL of the pumped Well recorded early on during the drilling process when the bore had just penetrated the shallow unconfined aquifer was -10.58 m, and the approximate elevation of the site is estimated as 25 m amsl (referenced from the LINZ topomap). Therefore, the water table lies at approximately 14.42 m amsl.

The bores located across the sand dunes adjacent to the coastline and NNE of the Pumped Well record water levels ranging from 14.4 to 16.3 m amsl. The water level data are shown in yellow on the map presented as Figure 1 (and included as Appendix B), which suggests a largely consistent set of water levels through the sand dune material. Due to the lack of triangulation typically provided by multiple data points, a definitive hydraulic gradient cannot be identified; however, a potentiometric slope likely exists toward the northwest.

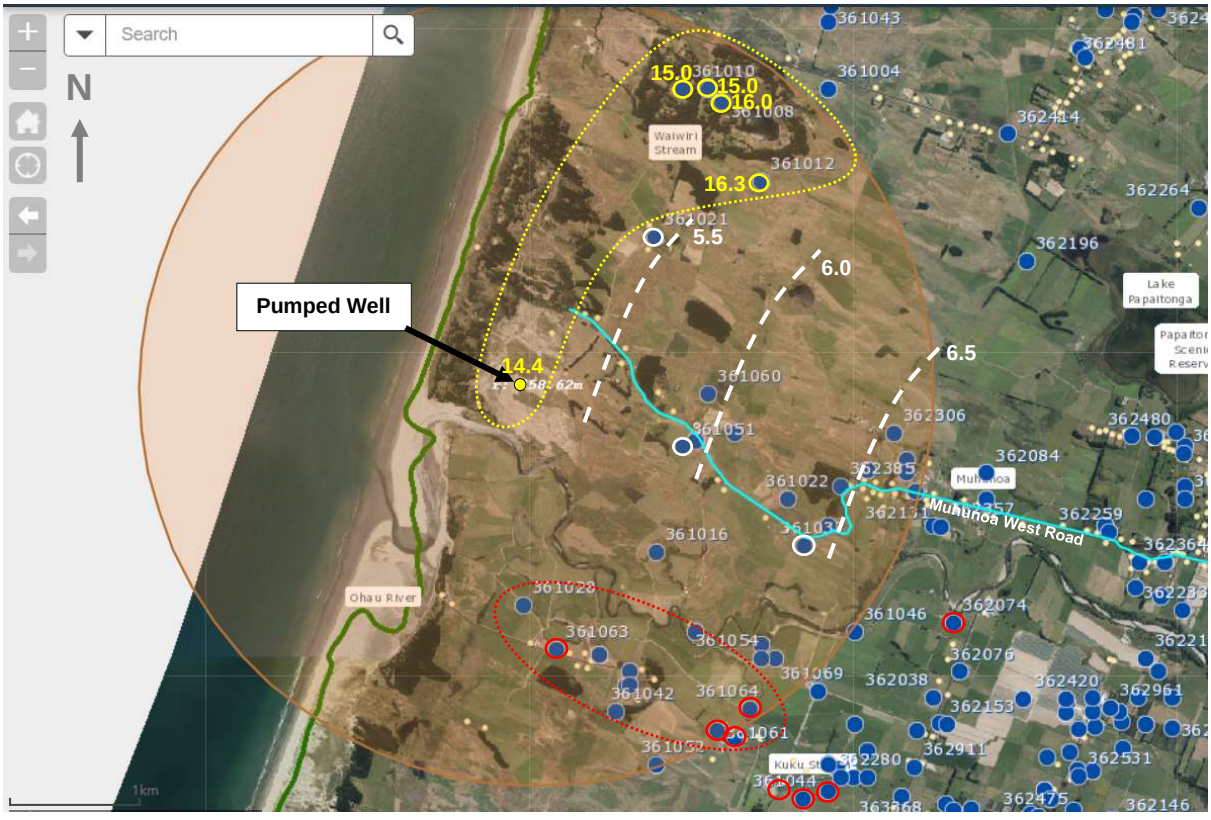


Figure 1: Horizons wells map showing wells within 3 km of Douglas Links well site.

To the east of the sand dunes, shallow groundwater bores drilled across the lower elevation Quaternary alluvial terrace provide SWL's that range from -2.80 to -4.10 m below ground level (bgl) and reflect water levels within the nearby Ohau River.

The data also infer an approximate potentiometric slope direction toward the NW (shown as white dashed lines in Figure 1). The bore data indicate water levels falling approximately 0.5 m over about 1 km toward the coast, although this is an estimate, it establishes an estimate commensurate with the matter at issue.

On the true left bank of the Ohau River, and south of the project area, the available water level data exhibits artesian aquifer conditions in confined shallow to deep bores, as displayed in red on Figure 1. Due to the groundwater being trapped in artesian aquifers beneath low permeability strata, the data points do not provide information on hydraulic gradient contouring, and there is no clear evidence of a dominant potentiometric slope across this area.

However, it is understood that the issue is one of groundwater being potentially infiltrated with nutrient-rich water from the surface, thereby contributing to a possible impact on the salt marsh adjacent to the Ohau River. In our view, the ecologists are better placed to assess any impact on the values of the salt marsh, but our findings show that the direction of any subsurface flow is more likely away from the salt marsh (i.e., toward the northwest).

Yours sincerely,

Alexandra Johansen
Principal Geologist/Hydrogeologist BSc (Hons)
Bay Geological Services Ltd

3. REFERENCES

Begg, J.G., and Johnston, M. R. (compilers), 2000: Geology of the Wellington Area. Institute of Geological and Nuclear Sciences 1:250,000 Geological Map 10. Institute of Geological and Nuclear Sciences, Lower Hutt, New Zealand.

Horizons Regional Council website (www.horizons.govt.nz).

Morgenstern, U., van der Raaij, R.W., Baisden, W.T., Stewart, M.K., Martindale, H., Matthews, A., Collins, S., 2019: Ohau and Waikawa catchments of the Horowhenua Groundwater Management Zone: groundwater dynamics, source, and hydrochemical processes as inferred from the groundwater tracer data. Lower Hutt, N.Z.: GNS Science. GNS Science report 2018/06. 52 p.

Report Limitations

This S92 response is written based on conditions and information as provided by third parties at the time of the desktop study. No interpretation is made on potential changes that may occur across the site or incorrectly reported by third parties. Subsurface conditions may exist across the site that are not able to be detected or revealed by the study within the scope of the project, and are therefore not taken into account in this response. Furthermore, statements included within this response are assumptions made for the purposes of providing interpretations of site geology and hydrogeology.

APPENDICES

APPENDIX A

Details for Surrounding Bores

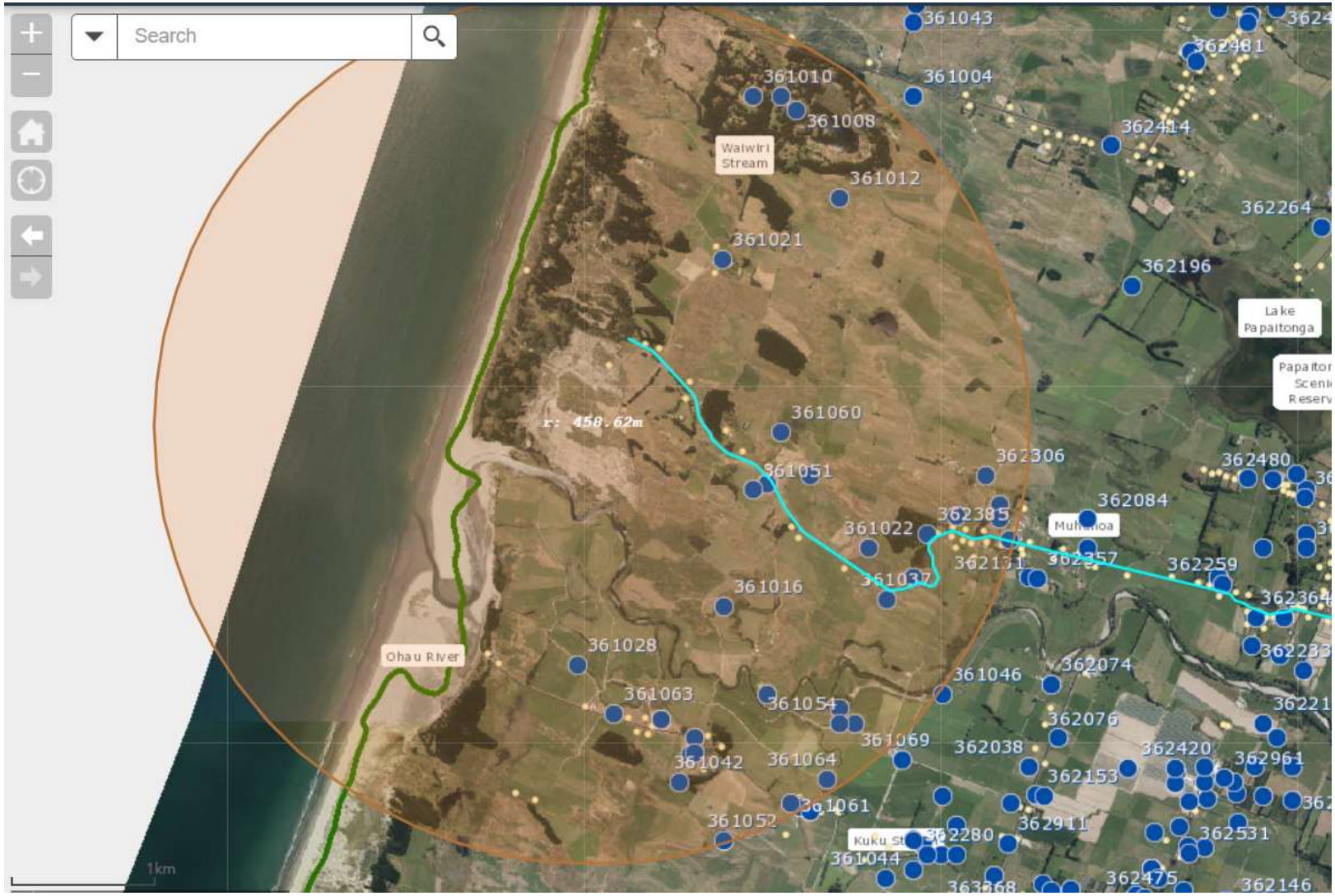
(Horizons)

id	Distance	Station_ Name_	elevation	depth	purpose_	Depth to Water	gwl(masl)	artesian	Screen ID	Screen fro	Screen to	Screen dia	Screen slo	Status	installation_date	owner	property_street_addr	Permit	Daily Max	Annual Ma	transmissi	specific_storage	swl date
361051	1198		20.00	45.80		-0.60	19.4	No	1	39.8	45.8	6	0.008		9/01/2003	Tahamata Corp	MUHUNOA WEST RD				86		9/01/2003
361041	1283		9.16	36.70		-3.70	5.463	No	1	33.7	36.7	4	0.006	Active	4/12/1989	CJ & Bossley - New					41		4/12/1989
361003	1290		8.70	10.00		-2.80	5.896	No						Active		C Bossley Old							1/01/1900
361060	1356		14.00	25.00												Easton							
361016	1471		11.00													Easton							
361028	1521		6.00													??Mata							
361030	1569		14.00													Easton							
361021	1580		7.42	24.00		-2.00	5.418	No	1	22	24	5	0.007		3/03/1988	JA& Shaw					23		3/03/1988
361063	1865		5.00	33.21	Irrigation	2.46	7.46	Yes	1	28.71	33.21	10			1/01/2011	Tahamata Incorporati	Kuku Beach Road	105735	4098	410770			26/01/2011
361027	1968		5.09	26.00		3.00	8.088	Yes							28/08/1972	L Richardson							28/08/1972
361022	2082		14.00	20.00												Tait							
361025	2129		9.00	9.00																			
361014	2156		6.00	5.00												A Honore No7							
361039	2250		5.00	20.00												T Marshall							
361020	2252		7.06	18.00												Haines BrosNo7							
361037	2331		10.41	10.74		-4.10	6.31	No	1	7.74	10.74	6	0.006		21/03/1997	J Haines					46		21/03/1997
361042	2410		8.00													G Kidd No1							
361012	2429	Levin STP Po	19.31	23.00	Monitoring	-3.00	16.31	No							13/07/1984	Horowhenua District Council					10		13/07/1984
362385	2434		7.00													H Richards							
361024	2435		9.00	5.00												Haines BrosNo6							
361036	2528		9.00	9.00												Haines BrosNo2							
361054	2601		9.00	9.00												Haines BrosNo1							
361079	2601		19.80	63.16	Farm supply	-1.00	18.805	No						Active	16/06/2021	Bryant	432 Muhunoa West Road						16/06/2021
361011	2604		9.46	62.00		0.60	10.06	Yes							13/09/1974	Denton (Ex Davies)					38		13/09/1974
361010	2645	Levin STP Po	16.00		Monitoring	-1.00	15	No								Horowhenua District Council							1/01/1900
361048	2669		9.00	9.00												Haines BrosNo3							
361008	2704	Levin STP Po	17.00		Monitoring	-1.00	16	No								Horowhenua District Council							1/01/1900
361006	2738	Levin STP Po	17.00		Monitoring	-2.00	15	No								Horowhenua District Council							1/01/1900
362306	2763		13.00	65.00												Siddall & Sons No2							
361064	2839		6.80	19.00		3.60	10.399	Yes								G Kidd No4							1/01/1900
361061	2846		15.00	19.90	Farm supply	0.70	15.7	Yes	1	18.41	19.9	6	0.15		9/06/2009	Tahamata Corporatio	Kuku Beach Road, Ohau						9/06/2008
361052	2882		15.00													G Kidd No2							
362166	2885		13.00	58.00												A Hooper							
361045	2900		7.58	19.75		0.50	8.08	Yes	1	18.22	19.75	6	0.15		14/09/1999	J Palliser					649		14/09/1999
362383	2901		12.00													RC Chapman							
361058	2961		9.00	14.00												G Kidd No3							
362131	2989		10.72	56.40											2/09/1968	B&E Hale							
361046	2997		10.00	9.00												Haines							

APPENDIX B

Horizons Wells Map

(2 km radius)


Search
361043
362481
361010
361004
361008
362414
Waiwiri Stream
361012
362264
361021
362196
Lake Papaitonga
r: 458.62m
361060
362306
362480
361051
362084
362385
361022
362357
362259
361016
361037
Ohau River
361028
362074
361046
361063
361054
362076
361069
362038
362420
362961
361042
361064
362153
361061
361052
362911
362531
Kuku St
362280
361044
362475
362146
1km

Attachment 3

Course layout iterations plan

Extent of UAV Coverage

N

Range Tees

Ohau River

LEGEND :

- Boundary
- Greens
- Maintained Turf Areas
- Original Green / Fairway Outline (August 2020)
- Hole Centreline
- Original Hole Centreline
- A — Change Since Original Design

32 16 0 32 64 96 m

PREPARED BY

LANDMATTERS

CLIENT

GRENADIER DEVELOPMENTS LIMITED

PROJECT

DOUGLAS LINKS - OHAU

DRAWING TITLE

COURSE LAYOUT ITERATIONS

DATE 8/9/2021

PROJECT NO. 709

SCALE 1:1600 @ A1
1:3200@ A3

DRAWING NO. 709-LAYOUT-CH

REV -

C:\12dS\data\LM-DATA\709 - Grenadier Developments Limited - Douglas Links - Ohau_786\10 Plans, Aerials, CAD\709-Course Layout Iterations.dwg, Plotted by Evan Pinfold at 8/9/2021 13:42:12

Attachment 4

Draft conditions (Applicant track change version)

Condition Schedule

Descriptive Specification

1. This resource consent authorises the discharge of up to 14,600 litres per day of secondary treated domestic wastewater, ~~and the discharge from three composting toilets~~ into and onto land at 765 Muhunoa West Road, Ōhau, on the property legally described as **Lots 1 & 2 DP 51446 and part of Lot 4 DP 44581 Blks I III Waitohu SD (Esplanade Reserve)** (hereafter referred to as the property) at approximate map reference **NZTopo50 Centroid BN33:833-979**.

   ADVICE NOTE: The Consent Holder shall ensure that water reduction fixtures are installed in the owner's dwelling and sleepout serviced by the wastewater treatment and land application systems. Water reduction fixtures include, but are not limited to, the following: Dual flush toilet cisterns, automatic washing machine, low water use dishwasher and no garbage grinder.

2. The Consent Holder must undertake the activity in general accordance with the consent application including all accompanying plans and documents first lodged with the Manawatū-Whanganui Regional Council on **2 July 2021** including the Erosion and Sediment Control Plan (ESCP) and associated Plans (June 2021), and;

   ~~1.~~a. further information received on **14 September 2021** via **email** being a partial response to the s92 request of **1 September 2021** and including ESCP Plans *(North West Corner, North East Corner, South West Corner, South East Corner Plan Numbers J709 – ENG–150 to 153, Revision B dated 3 September 2021)*;

   ~~2.~~b. further information received on **4 October 2021** via email being a partial response to an the Regional Council email of **1 October 2021** relating to ecological and coastal information; and

   ~~3.~~c. further information received on **1 November 2021** via **email** being a partial response to the s92 request (Cultural effects) of **29 October 2021.**

3. Where there may be inconsistencies between information provided by the Applicant and conditions of this resource consent, the conditions of this resource consent apply.

   ADVICE NOTE: Any variance from the location, design concepts and parameters, implementation and / or operation may require a new resource consent or a change of consent conditions pursuant to section 127 of the Resource Management Act 1991.

4. The Consent Holder must be responsible for all contracted operations related to the exercise of this resource consent and must ensure contractors are made aware of the conditions of this resource consent and ensure compliance with those conditions.

Commented [TB1]: Composting toilets removed from proposal in further information

5. A copy of these consents must be kept onsite at all times that physical works authorised by this resource consent are being undertaken and must be produced without unreasonable delay upon request from a servant or agent of the Manawatū-Whanganui Regional Council.

   ADVICE NOTE: An electric version of these consents is considered appropriate to satisfy **Condition 4**.

Pre-Development Assurance

6. The Consent Holder shall ensure that the wastewater treatment and disposal systems are installed to the on-site domestic wastewater management standard AS/NZS 1547:2012, and in general accordance with the concepts and parameters contained in the application documentation.

7. The Consent Holder shall ensure that the wastewater treatment and disposal systems are installed by an appropriately experienced, qualified and registered drain layer in order to meet industry standards in accordance with design specifications outlined in the application.

8. **Prior** to the commencement of discharge, and for the term of this consent, the Consent Holder shall ensure that each Land Application Area (LAA) is fenced off or closely planted (hedges) to deter stock, pets, people, and vehicles away from the LAAs.

   ADVICE NOTE: The purpose of the above condition is from a public health and infrastructure damage prospective.

9. The Consent Holder shall make available, a **50%** reserve land application area corresponding to each LAA, as shown on **Site Plan LOC-[numbers x 3]** on the property that is fully operational and can be used in the event that the corresponding main land application area is unavailable.

10. Within **three (3) months** of the installation of the discharge areas, the Consent Holder must ensure that each LAA has an established vegetative cover in accordance with the design and the list of native shrubs, small trees, ferns and grasses suitable for planting on evapo-transpiration beds / trenches attached in **Appendix A** of this consent, to aid the uptake of water and nutrients.

11. Requests for variations to the list of species in Appendix A can be made to the Manawatū-Whanganui Regional Council and to be certified by a member of the Consents Monitoring Team.

    ADVICE NOTE: Variations to the Appendix A can be supplied by emailing consents.monitoring@horizons.govt.nz

Environmental Standards

12. The design areal loading rate of the secondary treated domestic wastewater, which will be dosed by pump to land, shall not exceed **5 millimetres per day (5 mm/day).**

13. The Consent Holder must ensure that the rate, frequency, and method of the discharge of treated wastewater onto and into land does not result in any:

    a. contamination of groundwater,

    b. any ponding of wastewater on the soil surface, or

    c. surface runoff of wastewater to any adjacent drains (surface or subsurface), streams or beyond the property boundary.

14. The Consent Holder shall ensure any application of the wastewater has:

    a. a separation distance of no less than **twenty (20) metres** from any surface water bodies (including streams or drains or ephemeral drains) or potable water supply bores on the property;

    b. at least **1500 millimetres** vertical separation between the high winter water table and the level of the base of the disposal systems; and

    c. at least **1.5 m** from property boundaries (as per Table 2.2 the *Manual for On-site Wastewater Systems Design and Management* (Horizons Regional Council, 2010)).

15. The Consent Holder shall ensure that there is no objectionable odour beyond the property boundary, at any time, arising from the wastewater collection, treatment, or land application activities.

    ADVICE NOTE: Manawatū-Whanganui Regional Council staff will assess complaints about objectionable odour beyond the property boundaries in terms of whether or not the odour is objectionable to a reasonable ordinary person. When considering whether the odour is objectionable, Council staff with take into consideration the FIDOL factors: frequency, intensity, duration, offensiveness, and location.

16. The Consent Holder shall ensure that all stormwater from buildings and sealed surfaces such as driveways, is directed away from the wastewater treatment plants and the identified LAAs at all times.

Post-Development Assurance

17. The Consent Holder shall ensure that each wastewater system and the LAA and its vegetative cover is maintained to ensure compliance with conditions of this consent at all times.

18. Any failure of the systems, including uneven distribution due to the distribution method is to be reported to the Consents Monitoring Team of the Manawatū-Whanganui Regional Council within **five (5) working days** of detecting the failure.

    ADVICE NOTE: The Consents Monitoring Team can be contacted by email consents.monitoring@horizons.govt.nz or on freephone 0508 800 800.

19. Every **six (6) months** from the commencement of discharge, or more frequently if required by manufacturers specifications, the Consent Holder or a registered drain layer inspect, clean, and carry out any necessary maintenance of the wastewater systems to ensure the wastewater treatment plants are in good working condition in accordance with the wastewater system manufacturers' specifications.

20. The Consent Holder shall retain and update as necessary an On-Site Wastewater Management Plan for the site. The following matters shall be addressed, as a minimum:

    a. An inspection programme designed to verify the correct functioning of all components of each on-site wastewater treatment system.

    b. A schedule or checklist of maintenance requirements for all reticulation, pump chambers and components of each of the wastewater treatment and disposal systems. The maintenance requirements shall also specify that the secondary treatment and disposal systems shall be maintained on a minimum six-monthly frequency, in accordance with condition 19.

    ~~a.~~c. Evidence that a maintenance contract for the secondary treatment systems exists, to be applied for the duration of consent.

    ~~b.~~d. An outline of maintenance requirements for the composting toilets including ongoing management of solid waste from the toilets.

    ~~c.~~e. A copy of the names of the appropriate contact people in the event of system malfunction including contact telephone numbers.

    ~~d.~~f. A contingency plan for action to be taken in the event of malfunction or failure of system components at any of the treatment systems and/or disposal areas.

21. The Management Plan, along with any notification of any changes made to it, shall be provided to the Manawatū-Whanganui Regional Council within 6 months of exercising the consent or making changes to the Management Plan.

Monitoring

22. Within six **(6) months** of the wastewater system installation, the Consent Holder must supply the Manawatū-Whanganui Regional Council Consents Monitoring Team with a copy of the 'as-built' plans showing:

    a. the key components of each wastewater system including LAA and reserve area; and

    b. provide site photographs of fencing and planting of each LAA as required under **Conditions 8 and 10** of this consent.

    ADVICE NOTE: The as-built plans can be supplied by emailing consents.monitoring@horizons.govt.nz.

23. The Consent Holder shall keep a record of all inspections, including the details of any system malfunctions and repairs listed under **Conditions 18, 19 and 20** and make these available to the Manawatū-Whanganui Regional Council's Consents Monitoring Officer on request.

Review

24. The Manawatū-Whanganui Regional Council, under s128(1)(a) of the Resource Management Act, in July 2027, 2032 and 2037, serve notice of its intention to review the conditions of this resource consent for the purpose of reviewing the effectiveness of these conditions in avoiding and mitigating any adverse effects on the environment. The review of conditions shall allow for:

    ~~4.~~ ~~An assessment of the water abstraction volumes and rates detailed in the conditions of this consent against any future allocation policy, and if necessary a change to the monitoring outlined in the conditions of the consent; and/-OR-~~

    ~~5.~~d. To review the adequacy of and the necessity for monitoring undertaken by the Consent Holder; and/-OR-

    ~~6.~~e. deletion or amendments to any conditions of this resource consent to ensure adverse effects are appropriately mitigated; and/-OR-

    ~~7.~~f. addition of new conditions as necessary, to avoid, remedy or mitigate any unforeseen adverse effects on the environment.

~~25. The Manawatū-Whanganui Regional Council, under s128(1)(b) of the Resource Management Act, may review this resource consent, when a regional plan has been made operative which sets rules relating to maximum or minimum levels, flows or rates of water use, and in Manawatū-Whanganui Regional Council's opinion is appropriate to review the conditions of this consent in order to enable the levels, flows or rates set by the rule to be met.~~

Commented [TB2]: Not relevant to discharge consent

Commented [TB3]: Not relevant to discharge consent

Duration and Lapsing

~~26.~~25. If this resource consent is not given effect to by the commencement date + 5 Years it shall lapse pursuant to s125 of the Resource Management Act 1991.

~~27.~~26. The resource consent will expire on **1 July 2042**.

Appendix A

Horizons Regional Council's General List of Native Plants suitable for planting on evapo-transpiration beds

Native shrubs or small trees suited to moist or wet areas				
Common Name	**Botanical Name**	**Height***	**Soil^**	**Comments**
Karamu	*Coprosma robusta*	2 to 4	M	Rapid growth, hardy
Mingimingi	*Coprosma propinqua*	1 to 2	M-W	Divaricating habit
Twiggy tree daisy	*Olearia virgata*	2 to 4	M	White flowers in summer
Marsh ribbonwood	*Plagianthus divaricatus*	2	M-W	Coastal sites, divaricating habit
Mahoe	*Melicytus ramiflorus*	5 to 10	M	Fast growth, hardy
Cabbage tree	*Cordyline australis*	5 to 10	D-W	Fast growth, hardy
Putaputaweta; marble leaf	*Carpodetus serratus*	4 to 8	M	Very attractive, graceful tree
Rangiora	*Brachyglottis repanda*	3 to 5	M	Sun or shade, needs exposure to wind in humid areas
Pate	*Schefflera digitata*	3	M	For shady, sheltered sites
Manuka and cultivars	*Leptospermum scoparium and cvrs*	0.15 to 5	D-W	Many forms and flower colours
Native ferns suited to moist or wet areas				
Mamaku; black tree fern	*Cyathea medullaris*	5 to 15	M-W	Protect from frost and wind
Gully fern	*Cyathea cunninghamii*	5 to 15	M-W	Protect from frost and wind
Soft tree fern	*Cyathea smithii*	4 to 8	M	Needs cool, shady, sheltered spot and protection from frost
Wheki-ponga	*Dicksonia fibrosa*	2 to 6	M	Slow growing
Hen and chicken fern	*Asplenium bulbiferum*	0.6 to 1	M	Requires shade
Kiokio	*Blechnum novae-zelandiae*	1.2	M-W	New growth is red when grown in sunnier spot, fronds up to 3m long
Swamp kiokio	*Blechnum minus*	0.75	W	Sun or shade but must be wet
Crepe fern	*Leptopteris hymenophylloides*	0.6	M	Requires shade and shelter
Native grasses, sedges, rushes and other plants suited to moist or wet areas				
Jointed wire rush; Oioi	*Leptocarpus similis*	1	M	Coastal sites
Lake clubrush	*Schoenoplectus validus*	1.5	W	Needs full sun
Sea rush	*Juncus maritimus* var. *australiensis*	1	W	Coastal sites
Bog rush	*Schoenus pauciflorus*	0.5	W	Prefers permanently wet site
Knobby clubrush	*Isolepis nodosa*	1	M-W	
Three-square sedge	*Scirpus americanus*	0.6	M-W	
Cutty grass	*Gahnia setifolia*	up to 2.5	M	Sun or shade
Cutty grass	*Carex geminata*	1.2	M-W	Creeping rhizomes form large colonies - not suitable for gardens

Giant umbrella sedge	*Cyperus ustulatus*	0.6 to 1.2	M-W	Vigorous grower
Red tussock	*Chionochloa rubra*	1	M	Needs full sun for best colour
Raupo	*Typha orientalis*	up to 3	W	Can be invasive in gardens
Swamp astelia	*Astelia grandis*	up to 2	M-W	Sun or semi-shade
Toetoe	*Cortaderia fulvida*	1.5 to 2.5	D-W	Sun or semi-shade
Flax and cultivars	*Phormium tenax*and *Phormium* cvrs	0.3 to 3	D-W	Numerous foliage colours

* Height is at maturity and is measured in metres.

^ Soil relates to the soil moisture conditions tolerated/favoured where D = dry, M = moist and W = wet.

NOTE: The above is a general list of native shrubs, small trees, ferns and grasses suited to moist or wet areas.

Activity Specific Conditions

Descriptive Specification

1. These resource consents authorise the land disturbance and vegetation clearance at 765 Muhunoa West Road, Ōhau, on the property legally described as **Lots 1 & 2 DP 51446 and part of Lot 4 DP 44581 Blks I III Waitohu SD (Esplanade Reserve)** (hereafter referred to as the property) at 765 Muhunoa West Road, Ōhau, at approximate map reference **NZTopo50 Centroid BN33:833-979**.

2. The Consent Holder must undertake the activity in general accordance with the consent application including all accompanying plans and documents first lodged with the Manawatū-Whanganui Regional Council on **2 July 2021** including the Erosion and Sediment Control Plan (ESCP) and associated Plans (June 2021), and;

    a. further information received on **14 September 2021** via **email** being a partial response to the s92 request of **1 September 2021** and including ESCP Plans *(North West Corner, North East Corner, South West Corner, South East Corner Plan Numbers J709 – ENG–150 to 153, Revision B dated 3 September 2021)*;

    b. further information received on **4 October 2021** via email being a partial response to an the Regional Council email of **1 October 2021** relating to ecological and coastal information; and

    c. further information received on **1 November 2021** via **email** being a partial response to the s92 request (Cultural effects) of **29 October 2021.**

3. Where there may be inconsistencies between information provided by the Applicant and conditions of these resource consents, the conditions of these resource consents apply.

    ADVICE NOTE: Any variance from the location, design concepts and parameters, implementation and / or operation may require a new resource consent or a change of consent conditions pursuant to section 127 of the Resource Management Act 1991.

4. The Consent Holder must be responsible for all contracted operations related to the exercise of these resource consents and must ensure contractors are made aware of the conditions of these resource consents and ensure compliance with those conditions.

5. A copy of this consent must be kept onsite at all times that physical works authorised by these resource consents are being undertaken and must be produced without unreasonable delay upon request from a servant or agent of the Manawatū-Whanganui Regional Council.

    ADVICE NOTE: An electric version of this consent is considered appropriate to satisfy **Condition 4**.

Pre-Development Assurance

6. The Consent Holder must inform the Manawatū-Whanganui Regional Council Consents Monitoring Team in writing at least **ten (10) working days** prior to the commencement of activities of the start date of the works authorised by these resource consents.

   ADVICE NOTE: The Manawatū-Whanganui Regional Council Consents Monitoring Team can be contacted by phoning 0508 800 800 or via email at consents.monitoring@horizons.govt.nz

7. Prior to activities commencing as authorised by these resource consents, the Consent Holder must appoint a representative(s) who must be the Manawatū-Whanganui Council's principal contact person(s) in regard to matters relating to these resource consents. The Consent Holder must inform the Manawatū-Whanganui Regional Council of the representative's name and how they can be contacted, prior to these resource consents being exercised. Should that person(s) change during the term of these resource consents, the Consent Holder must immediately inform the Manawatū-Whanganui Regional Council and must also give written notice to the Manawatū-Whanganui Region Council of the new representatives' name and how they can be contacted.

8. The Consent Holder must arrange and conduct a pre-construction site meeting and invite, with a minimum of **ten (10) working days'** notice, the Manawatū-Whanganui Regional Council, the site representative(s) nominated under **Condition 6** of this consent, the contractor, representatives from Ngati Kikopiri, Muaupoko Tribal Authority and Te Iwi o Ngati Trust & other Mandated authorities and any other party representing the Consent Holder prior to any work authorised by this consent commencing on site. This must apply on an annual basis during the construction period with a pre-construction site meeting to be held every annual period commencing from **1 October**.

   ADVICE NOTE: In the case that any of the invited parties, other than the site representative does not attend this meeting, the Consent Holder will have complied with this condition, provided the invitation requirement is met.

9. The Consent Holder must, **ten (10) working days** prior to commencing activities authorised by this resource consent, provide the Manawatū-Whanganui Regional Council with a finalised Erosion and Sediment Control Plan (ESCP) for technical certification.

   ADVICE NOTE: The Consent Holder has provided an ESCP ('*Erosion and Sediment Control Plan Douglas Links Golf Course – Grenadier Limited: North West Corner, North East Corner, South West Corner, South East Corner Plan Numbers J709 – ENG–150 to 153, Revision B* (3 September 2021)) as part of its application. However, it is possible that once a contractor is engaged by the Consent Holder the ESCP may change as a result of input from the contractor.

   ADVICE NOTE: Regarding Manawatū-Whanganui Regional Council certification: Several conditions require the certification of the Manawatū-Whanganui Regional Council. That certification (or withholding of approval) must be based on the Manawatū-Whanganui Regional Council's assessment of whether the matters being considered achieve the objective of minimising sediment discharges from the site to the extent practicable.

10. The Consent Holder must undertake all earthworks authorised by this consent in accordance with the certified ESCP.

    ADVICE NOTE: The Consent Holder has provided an ESCP ('*Erosion and Sediment Control Plan Douglas Links Golf Course – Grenadier Limited: North West Corner, North East Corner, South West Corner, South East Corner Plan Numbers J709 – ENG–150 to 153, Revision B* (3 September 2021)) as part of its application. However, it is possible that once a contractor is engaged by the Consent Holder the ESCP may change as a result of input from the contractor.

    ADVICE NOTE: Regarding Manawatū-Whanganui Regional Council certification: Several conditions require the certification of the Manawatū-Whanganui Regional Council. That certification (or withholding of approval) must be based on the Manawatū-Whanganui Regional Council's assessment of whether the matters being considered achieve the objective of minimising sediment discharges from the site to the extent practicable.

11. Any changes proposed to the ESCP required by **Condition 9** must be confirmed in writing by the Consent Holder and certified in writing by the Manawatū-Whanganui Regional Council acting in a technical certification capacity, prior to the implementation of any changes proposed. In this regard, erosion and sediment control measures must be established and maintained in accordance with the document titled *"Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region dated February 2021"*, and the certified ESCP.

12. The Consent Holder must ensure that a copy of the certified ESCP required by **Condition 9**, including any certified amendments, is kept onsite and this copy is updated within **five (5) working days** of any amendments being certified.

13. The Consent Holder must prepare and forward a detailed schedule of construction activities to the Manawatū-Whanganui Regional Council **ten (10) working days** prior to the commencement of works authorised by these resource consents, and updates at one-month intervals during works. These must include details of;

    a. The commencement date and expected duration of the major cut and fill operations;

    b. The location of the major cut and fill operations;

    c. The location of topsoil stockpiles;

    d. The commencement and completion dates for the implementation of erosion and sediment controls; and

    e. The proposed construction and methodology, including staging of earthworks.

14. The Consent Holder must, prior to any earthworks commencing, submit to the Manawatū-Whanganui Regional Council a statement signed by an appropriately qualified and experienced professional certifying that all erosion and sediment control structures have been constructed in

accordance with the ESCP required by **Condition 9**. Erosion and sediment controls covered within the statement must include at least the silt fences and bunds. The certification statement must be supplied to the Manawatū-Whanganui Regional Council within **five (5) working days** of the completion of the construction of the structures concerned. Information contained in the certification statement must include at least the following;

a. Confirmation of contributing catchment areas;

b. The location, capacity and design of each structure;

c. Position of inlets and outlets;

d. Stability of the structures;

e. Measures to control erosion; and

f. Any other relevant matter.

15. The Consent Holder must submit a Spill Management Plan at least **ten (10) working days** prior to the commencement of any works authorised by this consent. The Spill Management Plan must include but not be limited to the following information:

a. Person(s) responsible for responding to any spills;

b. Potential sources of contaminants from the site and the proposed works; and

c. The proposed response procedures.

Environmental Standard

16. The Consent Holder must ensure that sediment losses to natural water arising from the exercise of these resource consents are minimised during the duration of the works and during the term of this consent. In this regard, erosion and sediment control measures must be established and maintained in accordance with the document titled *"Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region dated February 2021"* and the certified ESCP.

17. All earthmoving machinery, pumps, generators and ancillary equipment must be operated in a manner, which ensures spillages of fuel, oil and similar contaminants are prevented, particularly during refuelling and machinery servicing and maintenance. Refuelling and lubrication activities must be carried out away from any water body, ephemeral water body, or overland flow path, such that any spillage can be contained so that it does not enter surface water.

18. The Consent Holder must ensure that, as far as practicable, all clean water run-off from stabilised surfaces including catchment areas above the site must be diverted away from the exposed areas via

a stabilised system to prevent erosion. The Consent Holder must also ensure any outfall(s) of these systems are protected to minimise erosion.

19. During the construction period, discharges from the work site must not cause an increase in turbidity (NTU) in any flowing water body by more than **30%** after reasonable mixing.

    ADVICE NOTE: Reasonable mixing is defined as **seven (7) times** the bed width

20. There must be no discharge of airborne particulate matter that is objectionable to the extent that it causes an adverse effect at or beyond the boundary of the subject property.

    ADVICE NOTE: For the purpose of this consent, a Consents Monitoring Officer may assess the Frequency, Intensity, Duration, Offensiveness/Character and Location of Exposure (FIDOL) of any discharge to air determine whether the discharge is Offensive, Objectionable, Noxious and/ or Dangerous; definitions of these are provided in Chapter 15 of the One Plan 2018, or any superseding Regional Plan.

Operational Restrictions

21. The Consent Holder must ensure that a **maximum 2.0ha** of exposed earthworks associated with this proposal exists at any one time, unless a plan submitted in accordance with Conditions 9-11 authorises an alternative approach. Such change must be approved in writing by the Manawatū-Whanganui Regional Council acting in a technical certification capacity.

    Commented [TB1]: To allow for other approved construction approaches

22. The works authorised by this consent must be undertaken in such a manner so as to avoid flooding effects on adjacent land.

23. The Consent Holder must ensure that all erosion and sediment control structures are inspected on a weekly basis and within **twenty-four (24) hours** of each rainstorm event that is likely to impair the function or performance of the controls.

24. The Consent Holder must carry out monitoring and maintenance of erosion and sediment controls in accordance with the conditions of these resource consents and must maintain records detailing:

    a. The date, time and results of the monitoring undertaken; and

    b. The erosion and sediment controls that required maintenance; and

    c. The date and time when the maintenance was completed.

    These records must be provided to the Manawatū-Whanganui Regional Council at all reasonable times and within **seventy-two (72) hours** of a written request to do so.

Post Development Assurance

25. The removal of any erosion and sediment control measure from any area where soil has been disturbed as a result of the exercise of these resource consents must only occur after consultation and written approval has been obtained from the Manawatū-Whanganui Regional Council acting in a technical certification capacity. In this respect, the main issues that will be considered by the Manawatū-Whanganui Regional Council include:

    a. The adequacy of the soil stabilisation and/or covering vegetation;

    b. The quality of the water discharged from the rehabilitated land; and

    c. The quality of the receiving water.

26. The Consent Holder must ensure those areas of the site where earthworks have been completed must be stabilised against erosion as soon as practically possible and within a period not exceeding **three (3) days** after completion of any works authorised by these resource consents. Stabilisation must be undertaken by providing adequate measures (vegetative and/or structural) that will minimise sediment runoff and erosion to the satisfaction of the Manawatū-Whanganui Regional Council acting in a technical certification capacity. The Consent Holder must monitor and maintain the site until vegetation is established to such an extent that it prevents erosion and prevents sediment from entering any water body.

27. In the event of an archaeological site, waahi tapu or koiwi being discovered or disturbed during the activities authorised by this consent, the Consent Holder must immediately cease further works, in the immediate vicinity of the accidental discovery, and inform:

    a. the relevant iwi;

    b. the New Zealand Police;

    c. the Manawatū-Whanganui Regional Council's Regulatory Manager; and

    d. Heritage New Zealand.

    Further work in the immediate vicinity of the accidental discovery must be suspended while iwi carry out their procedures for removal of taonga. The Manawatū-Whanganui Regional Council's Regulatory Manager will advise the Consent Holder when work in the site, may recommence.

    ADVICE NOTE: In the event that human remains (koiwi) are found the police should be contacted immediately and all works must cease until advice is given that works can recommence.

    ADVICE NOTE: The Manawatū-Whanganui Regional Council's Regulatory Manager can be contacted on 0508 800 800.

    ADVICE NOTE: A Heritage New Zealand representative can be contacted, at the time of granting of these consents, on the following number 04 472 4341.

Commented [TB2]: As per HNZPT submission, the Applicant is in the process of applying for a general archaeological authority

Monitoring & Reporting

28. If any complaints are received by the Consent Holder regarding the activities authorised by these resource consents, the Consent Holder must notify the Manawatū-Whanganui Regional Council of those complaints as soon as practicable and no longer than one working day after receiving the complaint. If complaints are received, the Consent Holder must record the following details in a Complaints Log:

    a. Time and type of complaint, including details of the incident, e.g. duration, any effects noted;

    b. Name, address and contact phone number of the complainant (if provided);

    c. Location from which the complaint arose;

    d. The weather conditions and wind direction at the time of any dust complaint;

    e. The likely cause of the complaint;

    f. The response made by the Consent Holder including any corrective action undertaken by the Consent Holder in response to the complaint; and

    g. Futures actions proposed as a result of the complaint.

Duration and Lapsing

29. These resource consents will lapse pursuant to s125 of the Resource Management Act 1991 if not given effect to within five years from commencement.

30. These resource consents will expire **five years** from commencement.

Condition Schedule

Descriptive Specification

1. This consent authorises the abstraction of groundwater from **Bore No. 361080 o**n the property legally described as **Lots 1 & 2 DP 51446 and part of Lot 4 DP 44581 Blks I III Waitohu SD (Esplanade Reserve)** (hereafter referred to as the property) at 765 Muhunoa West Road at approximate map reference **NZTopo50 BN33 833 979.**

2. The Consent Holder must undertake the activity in general accordance with the consent application including all accompanying plans and documents first lodged with the Manawatū-Whanganui Regional Council on **2 July 2021** and;

    a. further information received on **14 September 2021** via **email** being a partial response to the s92 request of **1 September 2021**;

    b. further information received on **4 October 2021** via email being a partial response to an the Regional Council email of **1 October 2021** relating to ecological and coastal information; and

    c. further information received on **1 November 2021** via **email** being a partial response to the s92 request (Cultural effects) of **29 October 2021.**

3. Where there may be inconsistencies between information provided by the Applicant and conditions of the resource consent, the conditions of the resource consent apply.

    ADVICE NOTE: Any variance from the location, design concepts and parameters, implementation and / or operation may require a new resource consent or a change of consent conditions pursuant to section 127 of the Resource Management Act 1991.

Pre-Development Assurance

4. Prior to exercising this consent, the Consent Holder shall have an electromagnetic flow meter installed by an accredited installer. An accredited installer is currently accredited by Irrigation New Zealand (also referred to as IrrigationNZ) represented by the 'Blue Tick' logo. The flow meter must be:

    a. located on the water abstraction line; and

    b. have a pulse counter output traceably calibrated to +/- 5% or better; and

    c. capable of providing daily water use as well as a pulse counter output; and

d. positioned to measure the entire volume abstracted under authorisation of this consent; and

e. installed in accordance with the Resource Management (Measurement and Reporting of Water Takes) Amendments Regulation 2020; and

f. installed in accordance with the IrrigationNZ "The New Zealand Water Measurement Code of Practice" September 2018.

ADVICE NOTE: An accredited installer is currently accredited by Irrigation New Zealand (also referred to as IrrigationNZ) represented by the 'Blue Tick' logo. A list of accredited providers can be located at www.irrigationnz.co.nz

5. **Prior to** exercising this consent, the Consent Holder shall install and maintain, in fully operational condition, a GRS data logger / telemetry unit compatible with the Manawatū-Whanganui Regional Council's Telemetry System. The data logger / telemetry unit must be:

   a. Installed on the water abstraction line; and

   b. Have traceably calibrated to +/- 5% or better; and

   c. Set to New Zealand Standard Time.

   ADVICE NOTE: The GRS data logger / telemetry unit which is attached to the pulse counter output will be monitored by the Manawatū-Whanganui Regional Council to ensure compliance with the resource consent conditions and as part of a programme to enable monitoring of total catchment water use.

6. **Prior to** exercising this consent, the Consent Holder shall install and maintain an automatic backflow prevention device within the pump outlet plumbing or within the mainline to prevent the backflow of water through the meter referred to in **Condition 3** of this consent.

7. The Consent Holder shall ensure that the monitoring equipment referred to in conditions **3**, **4**, and **5** in respect to the flow meters, telemetry equipment and /or back flow preventer is located in a position where it can be read and safely accessed at all times.

8. The Consent Holder shall provide evidence of the pipe head works and associated infrastructure being installed in accordance with conditions **3** and **5** by submitting an installation certificate completed by an accredited installer and submitting it to the Manawatū-Whanganui Regional Council's Consents Monitoring Team Leader within **three (3) months** of the consent being granted.

   ADVICE NOTE: Installation certificates can be sent to the Consents Monitoring Team Leader via email consent.monitoring@horizons.govt.nz –OR– via mail addressed to: C/- The Consent

Monitoring Team Leader, Horizons Regional Council, Private Bag 11025, Manawatū Mail Centre, Palmerston North 4442.

Environmental Standards

9. The maximum daily abstraction of groundwater shall not exceed **1390 cubic metres per day (m^3/day)** from bore number **361080** at a maximum instantaneous rate of **17 litres per second (l/s)**.

10. The maximum annual abstraction rate of this resource consent shall not exceed **208,268** cubic **metres per year (208,268 m^3/year)**.

    ADVICE NOTE: The annual volume applies from 1 July – 30 June being the **first July** after consent the commences**.**

11. The Consent Holder shall, in circumstances when the electrical conductivity measured either under condition 17 of this consent exceeds:

    a. 750 µS/cm, immediately decrease the daily abstraction volume to a maximum of **927** m^3/day;

    b. 850 µS/cm, immediately decrease the daily abstraction volume to a maximum of **463** m^3/day;

    c. 1,000 µS/cm, immediately cease the abstraction and shall not resume the abstraction until written notification from the Manawatū-Whanganui Regional Councils Consents Monitoring Team Leader has been received confirming that abstraction can continue.

Commented [BG1]: The EC values proposed in C11(a to c) s appear excessively low. The pumped aquifer water samples analysed an EC of 561 uS/cm, so that doesn't give us much scope for error.
As an example, a similar WP (approx. 700 m from the coast) granted by Hawkes Bay Regional Council stipulated an EC of 1500 uS/cm as a condition (to sustainably reduce the daily volume pumped) and a limit of 2000 uS/cm as a condition to cease pumping.

It is suggested that the EC limits proposed in C11 (a, b and c) are amended to 1000, 1500 and 2000 uS/cm, respectively.

Operational Restrictions

12. In the event that the equipment detailed in conditions **3**, **4**, and **5** in respect to the flow meters, telemetry equipment and /or back flow preventer fails, replacement or repair will be at the Consent Holder's expense and replacement or repair will be required within **seven (7) days**.

Post-Development Assurance

13. Within **three (3) months** of installation, the Consent Holder shall have the flow meter (required by Condition **3**) verified by an Irrigation New Zealand "Blue Tick" accredited verifier.

14. The flow meter shall be verified by an Irrigation New Zealand "Blue Tick" accredited verifier every **five (5) years** thereafter to ensure compliance with condition 13. The Consent Holder shall provide evidence of the verification in writing to the Manawatū-Whanganui Regional Council's Consents Monitoring Team Leader within **one (1) month** of the verification being completed.

    ADVICE NOTE: Written verification can be sent to the Consents Monitoring Team Leader via email consent.monitoring@horizons.govt.nz –OR- via mail addressed to: C/- The Consent Monitoring Team Leader, Horizons Regional Council, Private Bag 11025, Manawatū Mail Centre, Palmerston North 4442.

Monitoring Provision

15. The Consent Holder shall allow any Manawatū-Whanganui Regional Council staff member and its agents to attach monitoring or telemetry equipment to monitor water use to ensure compliance with consent conditions and / or as part of a programme to enable monitoring of total water use.

16. In the event that the equipment detailed in conditions **3**, **4**, and **5** in respect to the flow meters, telemetry equipment and / or back flow preventer is removed for servicing or replacement, the Consent Holder shall notify the Manawatū-Whanganui Regional Council's Consents Monitoring Team Leader within **one (1) working day** and keep daily records of the volumes and rates of water abstracted under this resource consent. These records shall be submitted to the Manawatū-Whanganui Regional Council on a weekly basis until the equipment is reinstalled or replaced.

    ADVICE NOTE: Records can be submitted to the Consents Monitoring Team Leader via email consent.monitoring@horizons.govt.nz –OR- via mail addressed to: C/- The Consent Monitoring Team Leader, Horizons Regional Council, Private Bag 11025, Manawatū Mail Centre, Palmerston North 4442.

17. The Consent Holder shall in January, April and October of each year that the bore is in use, measure:

    a. groundwater levels under static conditions; and

    b. groundwater levels under pumping conditions; and

    c. electrical conductivity of pumped water.

18. The measurements shall be recorded in a log book and provided to the Manawatū-Whanganui Regional Council's Consents Monitoring Team Leader **within five (5) working days** of the measurements being made.

ADVICE NOTE: Measurements can be sent to the Manawatū-Whanganui Regional Council via email consent.monitoring@horizons.govt.nz –OR– by mail, addressed to: C/- The Consents Monitoring Team Leader, Horizons Regional Council, Private Bag 11025, Manawatū Mail Centre, Palmerston North 4442.

19. If measurements of electrical conductivity under condition 17 increase by 50% from any earlier measured value ~~-OR- are greater than 500 µS/cm~~, then the Consent Holder at their expense, shall:

    a. install telemetry to measure groundwater levels & electrical conductivity continuously; and

    b. collect one water sample in each month July, October, January and April for the duration of the consent; and

    c. have laboratory analysis undertaken on the sample for the parameters listed in **Table 1** below; and

    ~~d. have laboratory analysis undertaken for the ionic balance of the sampled water; and~~

    ~~e.~~d. provide the analysis results to the Manawatū-Whanganui Regional Council Consents Monitoring Team Leader.

Commented [BG2]: This Condition doesn't make sense as the initial EC in the well is 561 uS/cm (this information was included in the AQT Report).

It is suggested that the EC value is removed, leaving the Condition with an increase by 50% (as stipulated in the Hawkes Bay consent Condition 20 (attached)).

Commented [BG3]: Proposed that the highlighted section is deleted

Table 1: Water Quality Parameters

Parameter	Units
pH	
Calcium	ppm Ca^{2+}
Magnesium	ppm Mg^{2+}
Sodium	ppm Na^{+}
Potassium	ppm K^{+}
Iron	ppm Fe^{2+}
Manganese	ppm Mn^{2+}
Boron	ppm B^{3+}
Silica	ppm SiO_2
Sulphate	ppm SO_4^{2-}
Chloride	ppm Cl^{-}
Carbonate	ppm CO_3^{2-}
Bicarbonate	ppm HCO_3^{-}

ADVICE NOTE: Analysis Results can be sent to the Manawatū-Whanganui Regional Council via email consent.monitoring@horizons.govt.nz –OR– by mail, addressed to: C/- The Consents Monitoring Team Leader, Horizons Regional Council, Private Bag 11025, Manawatū Mail Centre, Palmerston North 4442.

~~**ADVICE NOTE:** The ionic balance of the sampled water should not have a discrepancy of greater than 5%.~~

Review

20. The Manawatū-Whanganui Regional Council, under s128(1)(a) of the Resource Management Act, in July 2027, 2032 and 2037, serve notice of its intention to review the conditions of this resource consent for the purpose of reviewing the effectiveness of these conditions in avoiding and mitigating any adverse effects on the environment. The review of conditions shall allow for:

    a. An assessment of the water abstraction volumes and rates detailed in the conditions of this consent against any future allocation policy, and if necessary a change to the monitoring outlined in the conditions of the consent; and/-OR-

    b. To review the adequacy of and the necessity for monitoring undertaken by the Consent Holder; and/-OR-

    c. deletion or amendments to any conditions of this resource consent to ensure adverse effects are appropriately mitigated; and/-OR-

Commented [BG4]: I haven't seen this Condtiion before.

This will be determined in the lab. However, the result could be dependent upon the appropriate calibration range and I understand that errors can be associated with titrations (I'm not an expert on this).

Commented [BG5]: I would recommend that this be increased to 10% as there may be too many variables out of our (and the lab's) control. But again, I'm not experienced in this field.

d. addition of new conditions as necessary, to avoid, remedy or mitigate any unforeseen adverse effects on the environment.

17. The Manawatū-Whanganui Regional Council, under s128(1)(b) of the Resource Management Act, may review this resource consent, when a regional plan has been made operative which sets rules relating to maximum or minimum levels, flows or rates of water use, and in Manawatū- Whanganui Regional Council's opinion is appropriate to review the conditions of this consent in order to enable the levels, flows or rates set by the rule to be met.

Commented [BG6]: The Condition numbering needs amending

Duration and Lapsing

18. If this resource consent is not given effect to by the commencement date + 5 Years it shall lapse pursuant to s125 of the Resource Management Act 1991.

19. The resource consent will expire on **1 July 2042**.

Definitions

ERP	Ecological restoration plan
ESCP	Erosion and Sediment Control Plan
Planting season	Refers to the optimal planting period for the relevant species and is defined as the months of May and June.
Ecological function	
Nutrient increase	
SDRP	Sand Daphne Relocation Plan

Activity Specific Conditions

Descriptive Specification

1. These resource consents authorise the land disturbance and vegetation clearance at 765 Muhunoa West Road, Ōhau, on the property legally described as **Lots 1 & 2 DP 51446 and part of Lot 4 DP 44581 Blks I III Waitohu SD (Esplanade Reserve)** (hereafter referred to as the property) at 765 Muhunoa West Road, Ōhau at approximate map reference **NZTopo50 Centroid BN33:833-979**.

2. The Consent Holder must undertake the activity in general accordance with the consent application including all accompanying plans and documents first lodged with the Manawatū-Whanganui Regional Council on **2 July 2021** including the Erosion and Sediment Control Plan (ESCP) and associated Plans (June 2021), and;

    a. further information received on **14 September 2021** via **email** being a partial response to the s92 request of **1 September 2021** and including ESCP Plans *(North West Corner, North East Corner, South West Corner, South East Corner Plan Numbers J709 – ENG–150 to 153, Revision B dated 3 September 2021)*;

b. further information received on **4 October 2021** via email being a partial response to an the Regional Council email of **1 October 2021** relating to ecological and coastal information; and

c. further information received on **1 November 2021** via **email** being a partial response to the s92 request (Cultural effects) of **29 October 2021.**

3. Where there may be inconsistencies between information provided by the Applicant and conditions of these resource consents, the conditions of these resource consents apply.

   ADVICE NOTE: Any variance from the location, design concepts and parameters, implementation and / or operation may require a new resource consent or a change of consent conditions pursuant to section 127 of the Resource Management Act 1991.

4. The Consent Holder must be responsible for all contracted operations related to the exercise of these resource consents and must ensure contractors are made aware of the conditions of these resource consents and ensure compliance with those conditions.

5. A copy of these consents must be kept onsite at all times that physical works authorised by these resource consents are being undertaken and must be produced without unreasonable delay upon request from a servant or agent of the Manawatū-Whanganui Regional Council.

   ADVICE NOTE: An electric version of these consents is considered appropriate to satisfy **Condition 4**.

Pre-Development Assurance

~~6. [**Place holder condition** to detail a lizard management plan including surveys, timescale for delivery and adaptive management processes (removal or avoidance) should a lizard hotspot be detected in any earthworks, vegetation removal or ecological site.]~~

7.6. [**Place holder condition** inviting [specified iwi representatives (two iwi submitters and Ngati Kikopiri)] to undertake Cultural Health Index Monitoring according to their tikanga. In the event, the specified iwi representatives consider Cultural Health Index Monitoring is required, the Consent Holder shall provide the Manawatū-Whanganui Regional Council's Regulatory Manager with a Cultural Health Index Monitoring Protocol developed in consultation with specified iwi representatives. The protocol~~, as a minimum, must~~ shall:

   a. Describe the relationship of tangata whenua to this site;

   b. Describe tikanga relevant to the proposed cultural monitoring, the activities, and the site;

Commented [TB1]: Applicant's ecologist considers this condition is not reasonable or required

Commented [TB2]: Provides certainty

Commented [TB3]: The Applicant is satisfied with this condition, pending an understanding of the position of the specified iwi in relation to the requirements of the condition

c. Identify and map (with map references) the site(s) to be monitored;

d. Set out the frequency of monitoring;

e. Describe the procedures required to access the application site for the monitoring (in particular health and safety requirements);

f. Identify the parameters and methods used for the monitoring; and

g. Set out the matters to be included in the Cultural Health Index Monitoring Report and the frequency of the reporting obligations.]

~~8.~~7. [**Place holder condition:** In the event [specified iwi representatives (two iwi submitters and Ngati Kikopiri)] determine Cultural Health Index monitoring is not required, the Cultural Health Monitoring protocol required by this condition does not need to be developed. The Regulatory Manager must be advised in writing if this condition is not going to be given effect to by way of correspondence provided to the Consent Holder from the specified iwi representatives.]

~~9.~~8. The Consent Holder must, **20 (20) working days** prior to commencing activities authorised by these resource consents, provide the Manawatū-Whanganui Regional Council with a finalised Ecological Restoration Plan for technical certification. The final Ecological Restoration Plan must include but is not limited to:

a. A plan showing proposed planting of ~~the identified Duneland~~ areas to include those contained in the draft restoration plan prepared by Boffa Miskell dated April 2022~~no less than 24.38 ha of either Active Duneland and/or Stable Duneland~~;

b. Appropriate species list including planting densities and planting methodologies;

c. Site preparation details with specific reference to the approaches proposed within the Duneland that address the complicated nature of duneland restoration;

d. Pest plant and pest animal control methodology and regime;

e. A monitoring plan for the duration of these consents for the golf course ensure plant densities and 95% survival rate are maintained; and

f. Details of the measures proposed to ensure protection in perpetuity of the compensation restoration within the Duneland features commensurate with the ~~1:11:5 ratio~~outcomes detailed in the ~~Application~~draft restoration plan.

~~10.~~9. The Consent Holder must ensure that all work required at the compensation sites as detailed in the final Ecological Restoration Plan required by **condition** ~~8~~9 above, must be completed ~~within the first planting season following commencement of site works~~in accordance with the draft restoration plan.

~~11.~~10. No restoration works ~~activity~~ on the subject site ~~must~~ shall commence until the ERP is technically certified by the Manawatū-Whanganui Regional Council.

~~12.~~11. The Consent Holder must undertake all ecological works in accordance with the certified ERP.

~~13. The Consent Holder must, **20 (20) working days** prior to commencing activities authorised by these resource consents, provide the Manawatū-Whanganui Regional Council with a Wetland and Lagoon Monitoring Plan must be submitted to Council for technical certification. The monitoring plan must include but is not limited to:~~

~~a. methodologies to provide baseline and ongoing monitoring measures to sufficiently measure the potential changes in ecological function and nutrient entering the Salt Marsh Wetland (Schedule F habitat) and the Ōhau River Lagoon (Schedule B), over the operation of the earthworks and for a period of no less than 5 years upon completion; and~~

~~b. the monitoring plan must specifically include pre-works monitoring to establish baseline condition in sufficient detail that changes can be measured.~~

~~14. In the event that monitoring reveals a decline in the ecological function and/or an increase of nutrient entering the Salt Marsh Wetland (Schedule F habitat) and the Ōhau River Lagoon (Schedule B), Consent Holder must advise Council as soon as practicable.~~

~~15. Within 20 working days of a decline in either ecological function or nutrient increase being identified, written confirmation of the effect including a description of the scale of effect and the known, actual or likely reasons for the effect must be prepared by a suitably qualified and experienced ecologist and be provided to the Regional Council. If it is determined that the effect on the Salt Marsh Wetland (Schedule F habitat) and/or the Ōhau River Lagoon (Schedule B) then the Consent Holder must recommended measure to address the effects.~~

Commented [TB4]: Applicant's ecologist considers these conditions are not reasonable or required

~~16. Prior to any vegetation clearance activity commencing authorised by these consents, the Consent Holder must submit a Katipo Management Plan (KMP), produced by a suitably qualified and experienced ecologist, to the Council for technical certification. The KMP should address the following:~~

~~a. Credentials and contact details of the Ecologist(s) who will implement the plan;~~

b. Time of the implementation of the KMP;

c. Detail of pre-clearance Katipo survey methodology;

d. Management and monitoring protocols for Katipo, including a description of the salvage methodologies and relocation protocols (including the methods used to identify suitable relocation site(s));

e. vegetation removal must be carried out in accordance with the approved FMP and requirements outlined in the condition above;

f. Where more than 10 Katipo spider are relocated, the ecologist or contractor will install one habitat enhancement feature into the relocation site(s); and

g. upon completion of the works, all findings resulting from the implementation of the KMP must be recorded by a suitably qualified and experienced ecologist and provided to Council.

ADVICE NOTE: For completeness, any additional requirements, required as part of Department of Conservation Permit process should also be detailed within the Katipo Management Plan.

Commented [TB5]: Applicant's ecologist considers this condition is not reasonable or required

17. Prior to any vegetation clearance activity commencing authorised by these consents, the Consent Holder must undertake an updated survey, by a suitable qualified and experienced ecologist, for any Sand Daphne to occur within the proposed vegetation clearance footprint.

18. In the event any Sand Daphne individuals are identified within the foot print the Consent Holder must prepare a Sand Daphne Relocation Plan (SDRP). The SDRP and submit to Council for technical certification.

19. The SDRP must be technically certified prior to any ecological and vegetation clearance works occurring.

20. The Consent Holder must undertake all ecological and vegetation clearance works in accordance with the certified SDRP.

21. The Consent may not commence ecological and vegetation clearance works until the SDRP is certified.

22. Upon completion of the ecological and vegetation clearance works, all findings resulting from the implementation of the SDRP must be recorded by a suitably qualified and experienced ecologist and provided to Council within 20 working days.

Commented [TB6]: Applicant's ecologist considers these conditions are not reasonable or required

Post-Development Assurance

~~23.~~12. In the event of an archaeological site, waahi tapu or koiwi being discovered or disturbed during the activities authorised by this consent, the Consent Holder must immediately cease further works, in the immediate vicinity of the accidental discovery, and inform:

a. the relevant iwi;

b. the New Zealand Police;

c. the Manawatū-Whanganui Regional Council's Regulatory Manager; and

d. Heritage New Zealand.

Further work in the immediate vicinity of the accidental discovery must be suspended while iwi carry out their procedures for removal of taonga. The Manawatū-Whanganui Regional Council's Regulatory Manager will advise the Consent Holder when work in the site, may recommence.

ADVICE NOTE: In the event that human remains (koiwi) are found the police should be contacted immediately and all works must cease until advice is given that works can recommence.

ADVICE NOTE: The Manawatū-Whanganui Regional Council's Regulatory Manager can be contacted on 0508 800 800.

ADVICE NOTE: A Heritage New Zealand representative can be contacted, at the time of granting of these consents, on the following number 04 472 4341.

Commented [TB7]: As per the HNZPT submission, the Applicant is in the process of applying for a general archaeological authority

Duration and Lapsing

~~24.~~13. These resource consents will lapse pursuant to s125 of the Resource Management Act 1991 if not given effect to within five years from commencement.

~~25.~~14. These resource consents will expire ~~five~~ ten years from commencement.

Commented [TB8]: To allow for completion of ecological restoration works

Activity Specific Conditions

Descriptive Specification

1. These resource consents authorise the land disturbance and vegetation clearance at 765 Muhunoa West Road, Ōhau, on the property legally described as **Lots 1 & 2 DP 51446 and part of Lot 4 DP 44581 Blks I III Waitohu SD (Esplanade Reserve)** (hereafter referred to as the property) at 765 Muhunoa West Road, Ōhau at approximate map reference **NZTopo50 Centroid BN33:833-979**.

2. The Consent Holder must undertake the activity in general accordance with the consent application including all accompanying plans and documents first lodged with the Manawatū-Whanganui Regional Council on **2 July 2021** including the Erosion and Sediment Control Plan (ESCP) and associated Plans (June 2021), and;

3. further information received on **14 September 2021** via **email** being a partial response to the s92 request of **1 September 2021** and including ESCP Plans *(North West Corner, North East Corner, South West Corner, South East Corner Plan Numbers J709 – ENG–150 to 153, Revision B dated 3 September 2021)*;

4. further information received on **4 October 2021** via email being a partial response to an the Regional Council email of **1 October 2021** relating to ecological and coastal information; and

5. further information received on **1 November 2021** via **email** being a partial response to the s92 request (Cultural effects) of **29 October 2021.**

6. Where there may be inconsistencies between information provided by the Applicant and conditions of these resource consents, the conditions of these resource consents apply.

   ADVICE NOTE: Any variance from the location, design concepts and parameters, implementation and / or operation may require a new resource consent or a change of consent conditions pursuant to section 127 of the Resource Management Act 1991.

7. The Consent Holder must be responsible for all contracted operations related to the exercise of these resource consents and must ensure contractors are made aware of the conditions of these resource consents and ensure compliance with those conditions.

8. A copy of these consents must be kept onsite at all times that physical works authorised by these resource consents are being undertaken and must be produced without unreasonable delay upon request from a servant or agent of the Manawatū-Whanganui Regional Council.

   ADVICE NOTE: An electric version of these consents is considered appropriate to satisfy **Condition 4**.

Pre-Development Assurance

General conditions: water quality and movement

9. The general conditions relating to water quality and movement are as follows:

    a. the activity must not result in the discharge of a contaminant if the receiving environment includes any natural wetland in which the contaminant, after reasonable mixing, causes, or may cause, 1 or more of the following effects:

        i. the production of conspicuous oil or grease films, scums or foams or floatable or suspended materials:

        ii. a conspicuous change in colour or visual clarity:

        iii. an emission of objectionable odour:

        iv. the contamination of freshwater to the extent that it is not suitable for farm animals to drink:

        v. adverse effects on aquatic life that are more than minor; and

    b. the activity must not increase the level of flood waters that would, in any flood event (regardless of probability), inundate all or any part of the 1% AEP floodplain (but *see* subclause (7)); and

    c. the activity must not alter the natural movement of water into, within, or from any natural wetland (but *see* subclause (8)); and

    d. the activity must not involve taking or discharging water to or from any natural wetland (but *see* subclause (8); and

10. Subclause (6)(b) does not apply if the person undertaking the activity—

    a. owns or controls the only land or structures that would be affected by a flood in all or any part of the 1% AEP floodplain; or

    b. has—

        i. obtained written consent to undertaking the activity from each person who owns or controls the land or structures that would be affected by a flood in all or part of the 1% AEP floodplain, after informing them of the expected increase in the level of flood waters; and

        ii. satisfied the relevant regional council that they have complied with subparagraph (i).

11. Despite subclause (6)(c) and (d), the temporary taking, use, damming, or diversion of water around a work site, or discharges of water into the water around a work site, may be undertaken if the following conditions are complied with:

a. the activity must be undertaken during a period when there is a low risk of flooding; and

b. the activity must be undertaken only for as long as necessary to achieve its purpose; and

c. before the activity starts, a record must be made (for example, by taking photographs) of the original condition of any affected natural wetland's bed profile and hydrological regime that is sufficiently detailed to enable compliance with paragraph to be verified; and

d. the bed profile and hydrological regime of the natural wetland must be returned to their original condition no later than 14 days after the start of the activity; and

e. if the activity is damming, the dam must be no higher than 600 mm; and

f. if the activity is a diversion that uses a pump, a fish screen with mesh spacing no greater than 3 mm must be used on the intake.

12. In subclauses (6) and (7), **1% AEP floodplain** means the area that would be inundated in a flood event of a size that has a 1% or greater probability of occurring in any one year.

General condition: earth stability and drainage

13. The general condition relating to earth stability and drainage is that the activity must not create or contribute to—

a. the instability or subsidence of a slope or another land surface; or

b. the erosion of the bed or bank of any natural wetland; or

c. a change in the points at which water flows into or out of any natural wetland; or

d. a constriction on the flow of water within, into, or out of any natural wetland; or

e. the flooding or overland flow of water within, or flowing into or out of, any natural wetland.

General conditions: earthworks, land disturbance, and vegetation clearance

14. The general conditions on earthworks, land disturbance, and vegetation clearance are as follows:

a. during and after the activity, erosion and sediment control measures must be applied and maintained at the site of the activity to minimise adverse effects of sediment on natural wetlands; and

b. the measures must include stabilising or containing soil that is exposed or disturbed by the activity as soon as practicable after the activity ends; and

c. the measures referred to in paragraph (b) must remain in place until vegetation covers more than 80% of the site; and if the activity is vegetation clearance, it must not result in earth remaining bare for longer than 3 months.

General conditions: vegetation and bird and fish habitats

15. The general conditions relating to vegetation and bird and fish habitats are as follows:

    a. only indigenous species that are appropriate to a natural wetland (given the location and type of the natural wetland) may be planted in it; and

    b. the activity must not result in the smothering of indigenous vegetation by debris and sediment; and

    c. the activity must not disturb the roosting or nesting of indigenous birds during their breeding season; and

    d. the activity must not disturb an area that is listed in a regional plan or water conservation order as a habitat for threatened indigenous fish; and

    e. the activity must not, during a spawning season, disturb an area that is listed in a regional plan or water conservation order as a fish spawning area.

General condition: historic heritage

16. The general condition relating to historic heritage is that the activity must not destroy, damage, or modify a site that is protected by an enactment because of the site's historic heritage (including, to avoid doubt, because of its significance to Māori), except in accordance with that enactment.

17. In subclause (13), **enactment** includes any kind of instrument made under an enactment.

General conditions: machinery, vehicles, equipment, and construction materials

18. The general conditions on the use of vehicles, machinery, equipment, and materials are as follows:

    a. machinery, vehicles, and equipment used for the activity must be cleaned before entering any natural wetland (to avoid introducing pests, unwanted organisms, or exotic plants); and

    b. machinery that is used for the activity must sit outside a natural wetland, unless it is necessary for the machinery to enter the natural wetland to achieve the purpose of the activity; and

    c. if machinery or vehicles enter any natural wetland, they must be modified or supported to prevent them from damaging the natural wetland (for example, by

widening the tracks of track-driven vehicles or using platforms for machinery to sit on); and

d. the mixing of construction materials, and the refuelling and maintenance of vehicles, machinery, and equipment, must be done outside a 10 m setback from any natural wetland.

General conditions: miscellaneous

19. The other general conditions are as follows:

a. the activity must be undertaken only to the extent necessary to achieve its purpose; and

b. the activity must not involve the use of fire or explosives; and

c. if there is existing public access to a natural wetland, the activity must not prevent the public from continuing to access the natural wetland (unless that is required to protect the health and safety of the public or the persons undertaking the activity); and

d. no later than 5 days after the activity ends,—

i. debris, materials, and equipment relating to the activity must be removed from the site; and

ii. the site must be free from litter.

Review

20. The Manawatū-Whanganui Regional Council, under s128(1)(a) of the Resource Management Act, in July 2027, 2032 and 2037, serve notice of its intention to review the conditions of this resource consent for the purpose of reviewing the effectiveness of these conditions in avoiding and mitigating any adverse effects on the environment. The review of conditions shall allow for:

a. An assessment of the water abstraction volumes and rates detailed in the conditions of this consent against any future allocation policy, and if necessary a change to the monitoring outlined in the conditions of the consent; and/-OR-

b. To review the adequacy of and the necessity for monitoring undertaken by the Consent Holder; and/-OR-

c. deletion or amendments to any conditions of this resource consent to ensure adverse effects are appropriately mitigated; and/-OR-

d. addition of new conditions as necessary, to avoid, remedy or mitigate any unforeseen adverse effects on the environment.

21. The Manawatū-Whanganui Regional Council, under s128(1)(b) of the Resource Management Act, may review this resource consent, when a regional plan has been made operative which sets rules relating to maximum or minimum levels, flows or rates of water use, and in Manawatū- Whanganui Regional Council's opinion is appropriate to review the conditions of this consent in order to enable the levels, flows or rates set by the rule to be met.

Duration and Lapsing

22. If this resource consent is not given effect to by the commencement date + 5 Years it shall lapse pursuant to s125 of the Resource Management Act 1991.

23. The resource consent will expire on **1 July 2042**.