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26 October 2023

Attention: Brett Hood
Reyburn & Bryant
PO Box 191
Whangarei

Email: brett@reyburnandbryant.co.nz

Dear Attention: Brett

Meridian Energy Limited - APP.045356.01.01 - LU 2300093: Initial response to Ecological Peer Review

Please see below our response to the primary concerns raised by Jack Warden, the Council-appointed ecologist, as outlined in Alister Hartstone's email 18 October 2023. As requested, we have focused on items 4-8 of the original Ecological Peer Review by RDL dated 3 October 2023.

4. Based on the brief site visit undertaken on the 28th of September 2023 there appears to be rather large discrepancy between the BML mapped wetland extent (Figure 1) and what can be observed on the ground. A small example of the BML mapped wetland areas compared with the potential additional wetland extent based on the most recent Google aerial imagery is provided below (Figure 2). It appears that the discrepancy in the overall natural inland wetland extent on site compared between BML mapping and a rapid desktop analysis carried out by RDL based on the most recent aerial imagery, is quite significant. It is noted that the BML assessment has relied on the 'rapid test' applied at locations across the project site, that BML have based their overall mapping exercise on a representative selection of identified wetland features being GPS'd though Fieldmaps, and that not all wetland areas on site had been ground-truthed/delineated. This is not deemed appropriate given that the proposal is based on "removal" of nearly 90% of the wetland areas on Site 1, so appropriate delineation of all wetland areas on site based on delineation carried out on the ground is required. Based on these results alone and without up-to-date aerial imagery overlaid, there is no context to the results of the wetland delineation carried out by BML. Please provide updated mapping and calculations to reflect the current wetland extent on Site 1 using accepted wetland delineation methods (MfE Wetland delineation protocols 2022) ensuring that all wetland areas have been appropriately delineated/ground-truthed.

The Ministry for the Environment wetland delineation protocols (MfE 2022) have been used to identify and delineate wetlands on the site, which is covered in section 3.2.2 and 3.2.3 of our report. The 'rapid test' is specified in these guidelines as an appropriate method to identify and delineate wetlands when the characteristics of the feature are obvious, e.g., where vegetation is entirely OBL or FACW species, or where the vegetation cover is predominantly pasture species.

Many wetland areas were able to be identified using the rapid test (as stated on page 12 of our report). Vegetation plots, hydric soil and hydrology indictors were used in areas of uncertainty, following the MfE (2022) methods. A total of 72 vegetation plots were undertaken on Site 1, over several site visits in a range of seasons and climatic conditions. A further 21 vegetation plots were undertaken on sites 2 and 3. This plot data is provided in Appendix 5 of our report.

We note that the MFE (2022) wetland delineation methods specify the use of representative plots to validate vegetation mapping using aerial photographs, maps, contours, and any existing data. A combination of on-site and off-site methods have been used to identify and delineate wetland boundaries, including vegetation patterns discerned from aerial imagery, topography, and representative plots that sampled soils, hydrology, and vegetation cover, in accordance with steps 6 – 10 of the MFE (2022) delineation protocols. Hence, we consider that our approach is consistent with accepted delineation methods.

Mapped wetland extents are based on the results from multiple site visits (total of 10 days of fieldwork by Sarah Hockings, Sarah Flynn, Tanya Cook and Ashley Flood), as well as recent satellite and drone imagery and topography (contour) data. We consider the extents mapped in our report are an accurate delineation of the wetland extent on the sites, given that:

- the identified wetlands are dynamic features that were found to change with season, climatic conditions and stock grazing pressure/farming practices, as discussed on page 25 of our report.

- steps 3 and 4 of the delineation protocols require that the procedure is undertaken when ‘normal circumstances’ are present, with respect to weather, climatic conditions and hydrology. The hydrological conditions were not ‘normal’ when the most recent satellite imagery was collected for google earth (24 March 2023), which is the imagery that the Council-appointed ecologist has relied on to assess the application. Hydrological conditions over the 2022/2023 spring/summer have been ‘abnormal’, with groundwater levels recorded at about 1 metre higher than previous maximum levels (refer Figure 1 below).

- The Council-appointed ecologist has not undertaken or referred to vegetation plots or other delineation methods specified in MfE (2022) in forming a view on wetland extent at the site. We note that our assessment sampled vegetation plots in some areas that the Council-appointed ecologist identifies as “likely additional wetland areas”, and these plots failed the dominance test, and/or prevalence index and/or had greater than 50% pasture species. Refer to Appendix 5 of our report.

Based on the above, we consider the wetland extent mapped in our report is an accurate and robust representation of the wetlands in Site 1 under ‘normal circumstances’ based on accepted wetland delineation protocols, and therefore do not require further mapping or calculation.

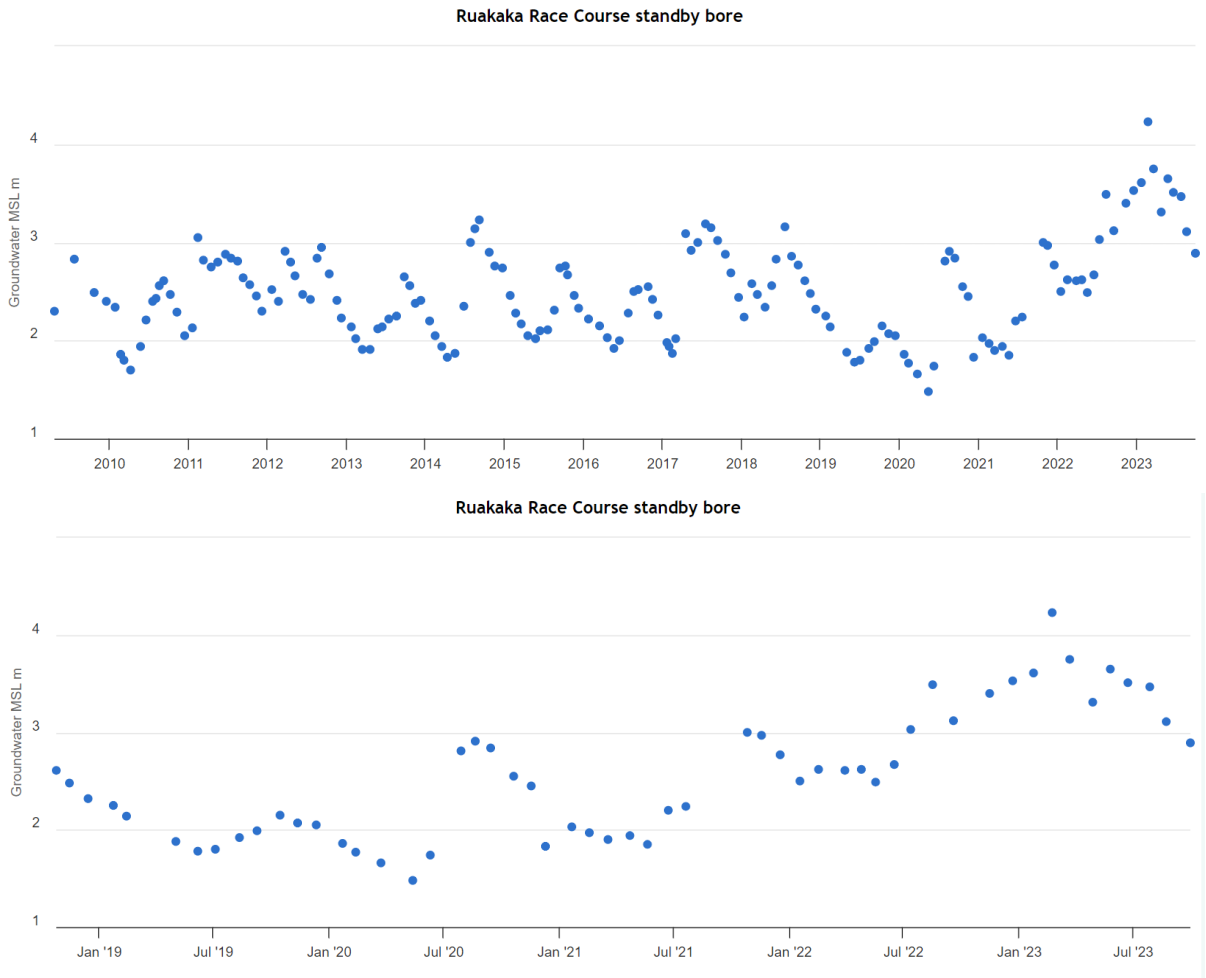

Figure 1: Groundwater level in Ruakaka Racecourse bore site over the last 14 years (top) and five years (bottom). Source: https://www.nrc.govt.nz/environment/environmental-data/environmental-data-hub/?moduleId=4&collectionId=45&displayId=1&siteId=1740&measurementId=139&daysOfData=1826

5. During the site visit on the 28th of September 2023, it was observed that large swaths of the wetland extent on site (although in mosaics) at the time of the visit were dominated by the obligate native willow herb (Persicaria decipiens) and therefore these areas are dominated by an indigenous species. Please provide updated mapping and calculations to reflect the current extent of areas identified as exotic and indigenous wetland.

While we agree that the native willow weed (*P. decipiens*) is present on Site 1 in places, as covered in section 4.2.4 of our report, the distribution of *P. decipiens* is limited to small, isolated patches and the majority of the *Persicaria* recorded during site visits was the exotic water pepper (*P. hydropiper*). As both species of *Persicaria* are annual herbs that die back in winter, their distribution within the sites will change seasonally and from year to year. The mapped extents of exotic and indigenous wetlands are accurate based on the dominant vegetation recorded during our site visits.

6. It was noted that the northern extent of Site 1 (observed from road edges and confirmed from observing in roadside drain) contained 'At Risk – Declining' Carex fascicularis. Please reassess the significance of the wetlands where this species is present.

A site visit was undertaken on Monday 16th October 2023 to confirm the presence and map the extent of *C. fascicularis* within site 1, which was misidentified as *Carex lessoniana* during earlier site visits. *C. fascicularis* is present in several locations in Site 1A. The majority are individual plants or small clumps of 3 to 4 plants within wetlands dominated by exotic vegetation, adjacent to historical drainage channels and the Bercich drain (refer to Figure 2 over the page). As these areas are dominated by exotic vegetation, they do not meet the definition of a significant wetland under the Proposed Regional Plan for Northland.

However, two large patches of *Carex fascicularis* (~100m^2 and 400m^2) are present, one in each of the two indigenous dominated wetlands in the south-eastern corner of site 1A (Figure 2). As these two wetlands are an area of indigenous vegetation, and meet criteria 2b of Appendix 5 of the Regional Policy Statement, they meet the definition of a significant wetland under the Proposed Regional Plan for Northland. The ranking value of these two wetlands is "Moderate" under the Whangarei District Plan. Our assessment of significance with respect to other wetlands remains the same as set out on page 49 of our report.

7. Removal of 17 ha of wetland habitats that supports 'Threatened' avifauna and likely 'Threatened' flora is proposed – I do not agree with BML conclusion that the ecological effect of what BML describe as temporary wetland habitat loss (taking into account the proposed offset measures) is "low". I do not agree that the wetland loss would be temporary, I consider it being permanent wetland loss which will result in significant adverse effects on 'Threatened' avifauna such as 'Critically Endangered' Australasian bittern, which have been confirmed to be present on Site 1. Please provide a detailed explanation how the wetland loss on Site 1 can be assessed as temporary loss.

We agree that the use of the word "temporary" is not correct in our concluding sentence in relation to wetlands. For wetlands that are proposed to be removed as part of the development the loss is permanent. The time lag between wetland loss and the proposed enlarged and enhanced wetland on site 1 and reinstated wetland on site 3 providing wetland habitat and function is expected to be short term (~ 3 years). Therefore, our conclusion, that the overall level of ecological effect on wetlands with the effective implementation of a comprehensive Wetland Restoration and Management Plan is low, remains the same.

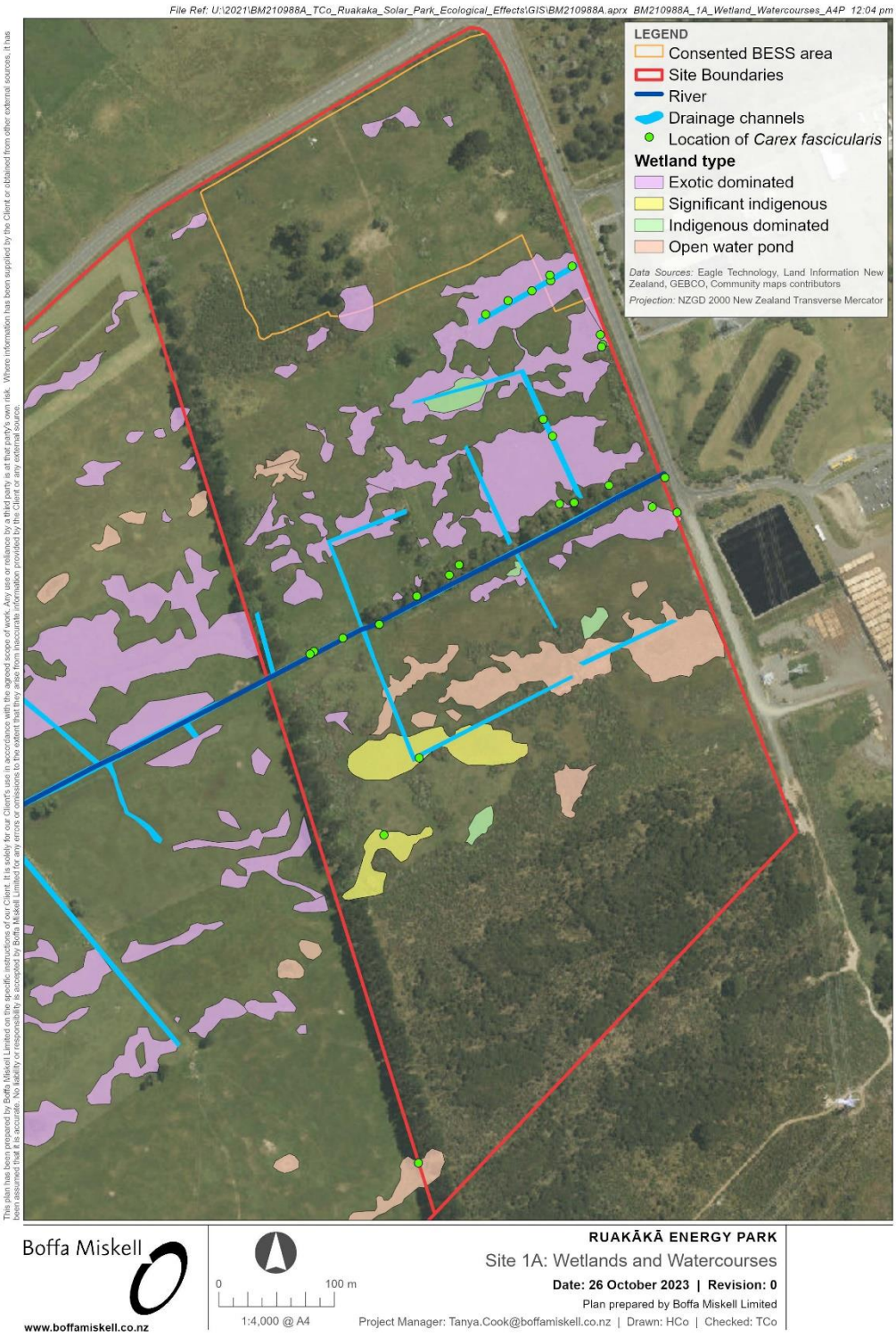

Figure 2: Location of Carex fascicularis and 'significant wetlands' in Site 1A

8. I do not agree that the proposed offset and mitigation measures are sufficient to ensure that no-net loss of wetland areas is achieved. I consider that an insufficient offset has been proposed. Best practice for wetland loss would suggest a minimum of 1:3 offset (based on international studies). Applying NZ methodology, if I analyse the proposal of 17 ha wetland loss and 19 ha wetland offset through Biodiversity Offsets Accounting Model (DoC) assuming that the offset wetland habitat would be a minimum 50% of the

quality/significance of the impacted wetland, by year 5 (typical for RC conditions), a minimum area of 34 ha of offset wetland would be required to achieve no-net loss. Can BML please provide their suggested offset calculations (excel spreadsheet including explanation of any assumptions applied to the calculations) based on Biodiversity Offset Accounting Model (Maseyk et al. 2015) as suggested under Condition 21a of the Proposed Conditions of Consent.

We have applied the commonly used currency of condition area (ecological condition x area) in our calculation to ensure the proposed offsetting will result in no net loss, using semi-quantitative condition data calculated from the attributes used to assess ecological value, in line with the offsetting principles in the biodiversity offsetting guidance document (Maseyk et al. 2018).

Offset feasibility (likelihood of success) is considered high, due to the proposed offset sites already being identified, a clear understanding of the wetland habitat characteristics to be recreated and the requirements to achieve this outcome, the short-anticipated lag time between the loss and restoration, and the well documented benefits of pest control for wetland avifauna. Therefore, an offset ratio of 1:1.5 has been used for the wetlands assessed as high ecological value. For the wetlands assessed as moderate or low value an offset ratio of 1:1 has been used as the offset wetlands will be of significantly higher ecological value than the wetlands that are being lost. Overall, the proposed wetland offset is of higher total area and higher condition area than the proposed wetland loss (refer to the table below).

	Total area (ha)	Total condition area
Proposed wetland loss	17.06	53.93
Proposed wetland offset	18.78	75.12

We have attached our excel spreadsheet to show our calculation method and assumptions. To ensure a successful outcome, the Wetland Restoration and Management Plan will include detailed documentation of site characteristics, restoration specifications and timeframes, a monitoring framework with measurable objectives and adaptive management options if required. Development and implementation of this plan is proposed as a condition of consent.

We are happy to have an online or in person meeting with Jack and others to discuss any of these items further as required.

Yours sincerely
BOFFA MISKELL LTD

Tanya Cook
Senior Professional Ecologist

Sarah Flynn
Senior Principal Ecologist

Attachments: BM210988A_Ruakaka_wetlands_offset_calculations Spreadsheet

cc: Andrew Guerin, Jack Warden, Micah Sherman, Alistair Hartstone