BEFORE THE WAIPĀ DISTRICT COUNCIL

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of Proposed Plan Change 20 – Airport Northern Precinct Extension to the Operative Waipā District Plan

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STATEMENT OF EVIDENCE OF JOSHUA ANDREW MARKHAM

(GENERAL ECOLOGY – OFFSET & COMPENSATION)

28 FEBRUARY 2023

Counsel acting:
JR Welsh
ChanceryGreen
223 Ponsonby Road
Ponsonby, Auckland 1011

ChanceryGreen
Environment Law and Strategy

INTRODUCTION

Qualifications and experience

1. My name is Joshua Andrew Markham. I hold the position of Principal Ecologist at Tonkin and Taylor Ltd.

2. I hold a Bachelor of Science (Ecology) and Postgraduate Certificate from Massey University of Palmerston North.

3. I have over ten years' experience in the field of ecology. In this time, I have worked across New Zealand in a wide variety of environments on projects for both the private and public sectors. From 2011 to 2013, I worked for Horizons Regional Council as Freshwater Field Ecologist; 2013 to 2015, I worked for Auckland Council as a Freshwater Ecologist advising on streamwork resource consent applications; 2015 to 2016, I worked for Golder Associates (now WSP) as a Senior Freshwater Ecologist and 2016 to present, I have worked for Tonkin & Taylor Ltd as a Senior / Principal Ecologist focusing on Landscape Ecology combining both Freshwater and Terrestrial Ecological aspects.

4. My relevant work experience has been to undertake and contribute to many ecological investigations within freshwater and terrestrial environments across New Zealand. I have worked in design and construction teams on large multi-disciplinary projects, regional council technical reviewer for resource consent application in terms of freshwater and terrestrial ecological aspects and undertaking technical compliance for large earthwork and streamwork projects.

5. I am familiar with the Proposed Plan Change 20 application site ("PC20 site") and the surrounding locality. I have read the relevant parts of: the application; submissions; further submissions and the Section 42A Report.

Involvement in Proposed Plan Change 20

6. I have been engaged by Titanium Park Limited ("TPL") and Rukuhia Properties Limited ("RPL") to prepare evidence for Proposed Plan Change 20 ("PC20"). I was the author of the Northern Precinct Expansion Assessment of Ecological Effects dated June 2022 associated with TPL/RPL's request with contributions from Adam Purcell (since left), Liz Curry, Laura Francis, Stephanie Angove-Emery and Abi Quinnell from Tonkin & Taylor Ltd.[1]

[1] Contributors qualifications – Adam Purcell (MSc (Hons) – Ecologist), Liz Curry (BSc (Hons), MSc (Hons), PhD, CEnvP – Technical Director Ecology), Laura Francis (BSc, MSc (Hons) – Ecologist), Stephanie Angove-Emery (BSc, MSc – Terrestrial Ecologist) and Abi Quinnell (BRM Parks, MEnvMgmt – Terrestrial Ecologist).

7. I have (and the contributors of the above report) visited the site and the locality on multiple occasions since 2020 to undertake field investigations.

8. I attended and contributed to expert conferencing for the Ecology and Bat Habitat topic on the 8 February 2023 and signed the joint witness statement ("JWS") that was produced.

Code of Conduct

9. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note (2023) and I agree to comply with it. In that regard, I confirm that this evidence is written within my expertise, except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

SCOPE OF EVIDENCE

10. In my evidence, I:

    (a) provide an executive summary of my key conclusions;

    (b) summarise the relevant aspects of PC20 with respect to general ecological values (excluding long-tailed bats which are addressed in Ms Cummings' evidence) and offset or compensation matters;

    (c) set out an assessment of PC20 with respect to anticipated ecological effects on general ecology (excluding long-tailed bats);

    (d) address relevant submissions; and

    (e) Respond to the s42A Report.

EXECUTIVE SUMMARY

11. This evidence provides a summary of ecological values, magnitude of effects and overall ecological effects for native birds, native lizards (copper skink) and freshwater environments. The detailed assessment of each of those matters are contained within the Ecology Report for PC20.

12. The Ecology Report followed the Ecological Impact Assessment Guidelines (EIANZ) which is considered a nationally recognised standard framework for the assessment of ecological effects.

13. The ecological values for the PC20 site that are considered in this evidence are:

(a) low level of ecological value and moderate magnitude of effect results in the overall level of ecological effect of low for vegetation removal (excluding potential bat roost trees).

(b) A low level of ecological value and low magnitude of effect results in the overall level of ecological effect of very low for native lizards (copper skink only).

(c) A low level of ecological value and low magnitude of effect results in the overall level of ecological effect of very low for native bird species.

(d) Artificial channels within the PC20 site have low ecological value for freshwater species and the proposal has a negligible magnitude of effect and overall, very low ecological effect on freshwater fauna.

14. EIANZ guidance sets out that an overall level of low and very low ecological effects should not normally be of concern, although normal design, construction and operational care should be exercised to minimise adverse effects.[2] Prescribed and standard mitigation measures for native birds and native lizards (copper skink only) have been incorporated into the above overall level of ecological effect. It is envisaged that mitigation measures will be part of the Ecological Management Plan ("EMP") as addressed in rule 10.4.2.14.B for native birds and native lizards (copper skinks) without the need to apply offset / compensation actions. This is also consistent with the Waikato Regional Policy Statement ("WRPS") which only requires offsetting for non-significant habitats of indigenous fauna to achieve no net loss at a regional scale where there are significant adverse effects that are unable to be avoided, remedied or mitigated.[3] Therefore, sections within this evidence that cover residual effects management actions (offsetting / compensation) relate to long-tailed bats only.

15. In this instance an offsetting approach has been evaluated and discounted based on inherent complexities relating to long-tailed bats. The proposed option of accounting for residual effects on long-tailed bats is by using a Biodiversity Compensation Model

[2] Ecological Impact Assessment (EcIA) – EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems, 2nd Edition May 2018 [Page 84, para. 7].
[3] Inger EIC[para. 52].

(BCM). To achieve a 10% predicted net gain outcome in biodiversity over a 10-year period the residual effects management approach based on my preliminary assessment[4] of the PC20 proposal is likely to require:

(a) 11ha of vegetation restoration and/or enhancement outside of the PC20 site for the purpose of establishment of commuting and foraging corridors for long-tailed bats.[5]

(b) 80ha of pest animal control over a 10-year period in areas that long-tailed bats are known to frequent.

16. The ecological values and effects on matters relating to general ecology for PC20 have been adequately identified and addressed through the PC20 Ecology Report and within the below evidence. I have also had regard to Ms Cummings' evidence in relation to long-tailed bats. The amended provisions take the correct approach by providing a framework in which offset / compensation for residual effects can be applied at the resource consenting stage. The preliminary assessment of the compensation package, combined with the conditional purchase of the proposed compensation site by the applicants, provides a higher level of confidence in the likely compensation actions than may otherwise typically exist at this point in a plan change process.

CONTEXT AND BACKGROUND

Site Description

17. The PC20 site is approximately 130ha and bounded by Raynes and Narrows Road to the north, Middle and Ohaupo Roads to the west and by Hamilton Airport to the south and west as shown in Figure 1 below. As described by Mr Grala in his evidence, approximately 41ha of the Site is already zoned Airport Business Zone and the remainder of the Site (approximately 90ha) is currently zoned Rural. PC20 seeks to rezone the existing Rural zoned land as Airport Business Zone to enlarge the existing Northern Precinct.

[4] Preliminary in that a BCM can only be applied once all details are known for example if and when vegetation is removed, timing of replacement planting etc. For that reason, a Bat Management Plan and Ecological Management Plan are required under PC20 for subsequent consenting requirements.
[5] This is in addition to 4.9ha of habitat enhancement of Bat Habitat Areas ("BHA") within the PC20 site which is mitigation.

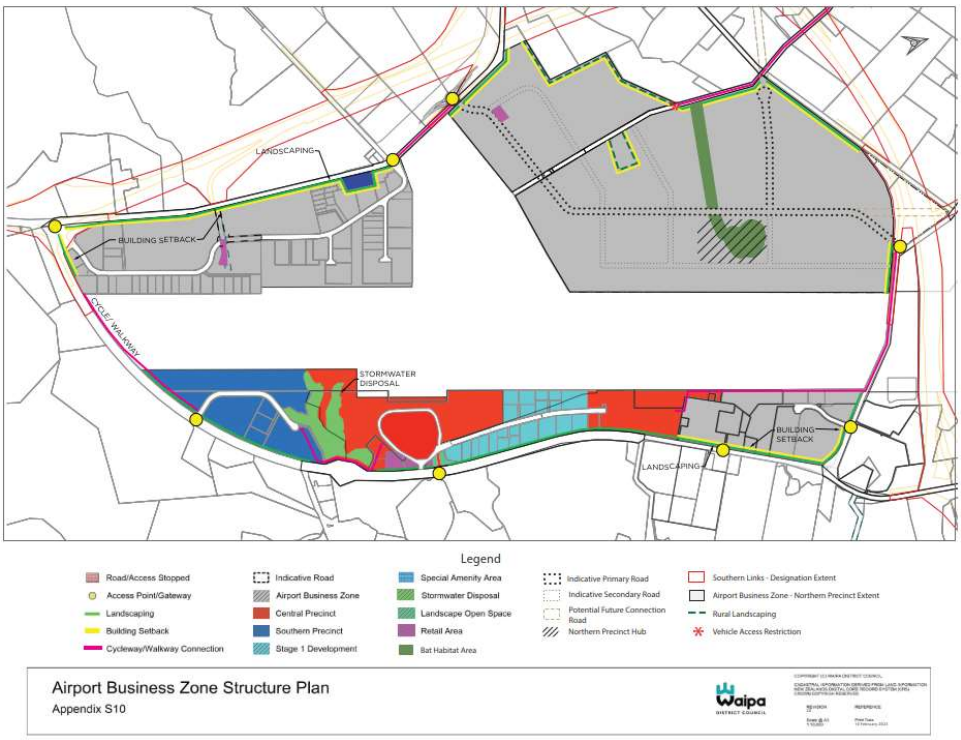

Figure 1: Proposed extension of the Northern Precinct of the Airport Business Zone.

18. The spatial extent of the Northern Precinct that already comprises the Airport Business zoning is shown by the orange outline in Figure 2 below. Of relevance to considering the ecological effects that may arise from PC20 is that this includes just over half of what is intended to form the 'Hub'.

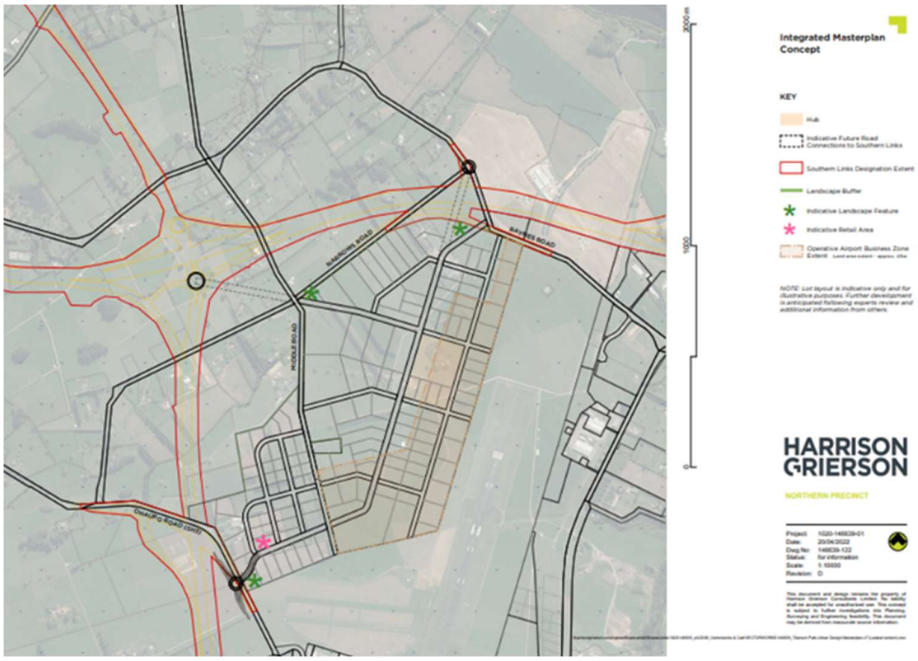

Figure 2: Northern Precinct Masterplan

19. The PC20 site is generally flat with two small hills in the eastern part and is predominantly used for agricultural (grass) and cropping (maize).

20. The ecological context of the site as detailed in the Ecological Report is summarised below:

(a) Vegetation across the PC20 site is predominantly pasture grass and maize with isolated patches of exotic and native trees used as shelterbelts predominantly.

(b) A network of artificial watercourses have been established for drainage purposes and no natural streams or wetlands have been identified. As these channels are predominantly dry all year round it is considered unlikely that any native fish species are present.

(c) Eight non-threatened avifauna species were observed across the PC20 site. It is considered that the PC20 site provides low quality habitat for avifauna and these species are considered typical in most agricultural environments.

(d) The only native lizard species that is possibly present in low densities is copper skink. Small, isolated areas of low-quality potential habitat is found across the PC20 site. No native gecko habitat was found across the PC20 site, so they are not considered to be present.

(e) There are no Significant Natural Areas (SNA's) recorded across the PC20 site or areas of remanent native vegetation.

(f) In summary, the ecological context of the site is typical agricultural land use, which for the PC20 site is further degraded by the high level of crop rotation.

OVERVIEW OF THE PLAN CHANGE

21. In addition to rezoning approximately 89ha of land from Rural Zone to Airport Business Zone, PC20 also proposes to update the Airport Business Zone Structure Plan to include the full 130ha of the Northern Precinct and to amend numerous provisions which will apply to development within that area.

22. The proposed plan change will result in the conversion of the current land use to predominantly industrial use with a retail and amenity hub and roading generally consistent with the pattern developed through the master planning process. This includes:

(a) Two indicative Primary Roads, one of which will extend from Raynes Road down to State Highway 3 (the Main Spine Road), and another which will extend from the Narrows Road/Middle Road intersection to the centre of the Northern Precinct.

(b) Two new access points / gateways onto State Highway 3 and Raynes Road that are located at either end of the Main Spine Road through the precinct.

(c) Walking and cycling connections that will be established between the Northern Precinct and the Raynes / Southern Precincts.

(d) A walking and cycling connection that is being promoted between the Northern Precinct and the Peacocke growth cell to the north.

(e) Providing a holistic and comprehensive view of how the Airport Business zone can be integrated into Southern Links when it is constructed.

23. Landscaping and setback controls are proposed on the external boundaries of Northern Precinct that adjoin the Rural zone and setback and lighting controls are proposed in relation to BHAs which are now proposed within the PC20 site (see Figure 1). The Hub within the centre of the Northern Precinct, preserves an area of ecological value for long-tailed bat habitat and is intended to be a higher amenity space within the precinct that will provide a limited extent of retail to support the convenience needs of people visiting

and working within the precinct. A set of amended provisions (which I refer to as the "amended provisions") have been provided that are attached as Annexure 2 of Mr Grala's evidence. The amended provisions were discussed as part of the ecology and bat habitat conferencing topic and are referred to in the JWS Ecology and Bat Habitat. Mr Inger discusses the amended provisions as they relate to ecological matters in his evidence.

SUMMARY OF ECOLOGY VALUES AND EFFECTS ACROSS THE PC20 SITE

24. The Ecology Report for PC20 followed the EIANZ Guidelines which is a nationally recognised standard framework for the assessment of ecological effects.

25. The EIANZ Guidelines provide a framework is used to identify residual effects on biodiversity values after measures to avoid, remedy or mitigate potential adverse effects. The framework steps through:

    (a) Ecological value of a habitat or species.

    (b) Magnitude of effect based on the ecological value.

    (c) Level of residual effect which is a combination of ecological value and magnitude of effect.

26. As stated in the EIANZ guidance, if the level of residual effect is high and moderate then the level of effect requires careful assessment and analysis. Such residual effects could be managed through avoidance, design or extensive offset or compensation actions,[6] or greater after mitigation interventions then residual effects management is recommended.

27. A full description of ecological values, magnitude of effects and overall level of effects across the PC20 site can be found within the Ecology Report and are summarised below, albeit excluding bats in which I refer to Ms Cummings' evidence.

Vegetation

28. The vegetation across the PC20 site is predominantly managed maize and pasture and typical of most farm environments tall stature vegetation is generally restricted to driveways, shelterbelts and around dwellings (farm sheds and houses). For ease of reference the vegetation description has been broken down to the TPL and RPL properties that collectively comprise the PC20 site. The TPL property is the part of the

[6] Ecological Impact Assessment (EcIA) – EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems, 2nd Edition May 2018 [Page 84, para. 6].

site north of Middle Road and the RPL property is the part of the site south of Middle Road.

29. Within the PC20 site, vegetation on the TPL property consists of:

(a) Cypress (*Cupressus sp.*), alder (*Alnus glutinosa*), casuarina (*Casuarina cunninghamiana*), totara (*Podocarpus totara*) and crack willow (*Salix fragilis*) forming smaller shelterbelts on the northern portion of the property.

(b) Pin oak (*Quercus palustris*), maple (*Acer sp.*), Persian silk tree (*Albizia julibrissin*), callery pear (*Pyrus calleryana*), kohuhu (*Pittosporum teniofolium*) in a small discrete area immediately west of the homestead.

(c) Kauri (*Agathis australis*), London plane (Pla*tanus x acerifolia*), oak (*Quercus robur*), liquid amber (*Liquidambar styraciflua*), and common ash (*Fraxinus excelsior*) as individual large specimen trees scattered across the property.

(d) Citrus trees (*Citrus spp.*), cherry trees (*Prunus sp.*), cabbage trees (*Cordyline australis*), ginkgo (*Ginkgo biloba*), mamaku (*Cyathea medullaris*), buxus shrubs (*Buxus sempervirens*), karo (*Pittosporum eugenioides*) and avocado (*Persea americana*) in and around the homestead and Bruntwood nursery.

(e) Rank grass along farm races and around farm sheds.

30. Within the PC20 site, vegetation on the RPL property consists of:

(a) Chestnut (*Catanea sp.*) grove approximately 0.25ha exists on the western portion of the property (I note that the majority of this grove (approximately 0.47 ha) extends into the Southern Links designation and it is therefore outside the PC20 site and rezoning area for the Northern Precinct).

(b) Mānuka (*Leptospermum scoparium*), flax (*Phormium tenax*), swamp astelia (*Astelia grandis*), lacebark (*Hoheria sp.*), kahikatea (*Dacrycarpus darcridioides*), rimu (*Dacrydium cupressinum*) and silver beech (*Lophozonia menziesii*) in three small discrete planted areas.

(c) Pine (*Pinus sp.*) and gum (*Eucalyptus sp.*) trees in individual locations.

31. Due to the dominance of grass, maize and exotic vegetation across the PC20 site the ecological assessment found vegetation to be low ecological value with a moderate

magnitude of effect if all the vegetation was removed (which is not proposed – see paragraph 32 below). This results in an overall low level of ecological effect.

32. It is noted that not all vegetation across the PC20 site is proposed to be removed. Vegetation within the identified BHA's is likely to be retained and some vegetation along the Rural Zone boundaries of the site may also be retained as part of the required landscape buffers. This approach has been incorporated into the PC20 provisions (including the amended provisions) including the structure plan, policy 10.3.2.2A and rules 10.4.2.6, 10.4.2.6A, 10.4.2.6B and 10.4.2.14B which set out requirements for landscape planting and the treatment of BHA's and Rural zoned landscape buffers.

33. There are no significant natural areas or features mapped in the Waipa District Plan within the PC20 site.[7] I also consider that there is no vegetation or habitats for indigenous fauna within the PC20 site that meets the significance criteria in APP5 of the WRPS for the ecological values that I have assessed (which exclude long-tailed bats in which I refer to Ms Cummings evidence).

34. Overall, the enhancement of the BHAs, the creation of landscaped buffers along Rural Zone boundaries and the compensation that is expected to be required to address residual effects on long-tailed bats will result in a net gain for vegetation.

Lizards

35. The only native lizard considered to possibly be present across the PC20 site, albeit it likely in low densities, is the copper skink (*Oligosoma aeneum*) which is classified as At Risk – Declining.[8] Low quality isolated areas of suitable skink habitat which includes rank grass, log piles, leaf litter under vegetation and buildings.

36. The continual disturbance of the PC20 site through the rotation of pasture and maize cropping significantly reduces the amount of habitat available for copper skink and potentially prevents this species becoming established in medium to high densities throughout the PC20 site.

37. Due to the habitat being low value and isolated and copper skinks potentially being found in low densities (if under detection limits it is hard to prove presence or absence of the

[7] Refer to Inger EIC [paras. 26 to 30]. Mr Inger[7] provides a detailed statutory assessment of identified and mapped significant areas of which none are located on the PC20 site.
[8] New Zealand Threat Classification Series 35, Conservation Status of New Zealand Reptiles, 2021. Department of Conservation, Wellington.

species) they have been given a low level of ecological value with a low magnitude of effect which results in an overall very low level of ecological effect.

38. It is noted that no native gecko habitat was recorded across the PC20 site which gives a high level of confidence that they are not present, so they have not been further assessed.

Avifauna

39. The habitat for avifauna across the PC20 site is restricted to shelterbelts and individual trees. The quality of this habitat is considered low and only used by range of non-threatened[9] common native and introduced bird species (see Table 1 below) that are typical of agricultural environments.

Table 1: Avifauna species observed to be present across the PC20 site[10]

Common Name	Scientific Name	Threat Status	Property observed
Grey warbler	*Gerygone igata*	Not Threatened	TPL
NZ fantail	*Rhipidura fuliginosa*	Not Threatened	TPL
Paradise shelduck	*Tadorna variegata*	Not Threatened	TPL
Pukeko	*Porphyrio melanotus*	Not Threatened	TPL
Sacred kingfisher	*Todiramphus sanctus*	Not Threatened	TPL

40. Although potential habitat for avifauna across the PC20 site is considered restricted and of low value, the removal of this vegetation has the potential to directly disturb, injure or kill birds that may be utilising the site. Native birds are particularly vulnerable to disturbance during the breeding season, when adult nesting birds, chicks, and eggs can be lost or displaced. Therefore, mitigation interventions such as bird breeding season restrictions should be considered as part of the EMP. This can be addressed in the EMP at resource consent stage in accordance with rule 10.4.2.14B(b) in the amended provisions.

41. A low level of ecological value and low magnitude of effect results in the overall level of ecological effect of very low for bird species. Furthermore, the low magnitude of effect has been assigned based on a minor shift from baseline conditions considering the

[9] New Zealand Threat Classification Series 19, Conservation Status of New Zealand Birds, 2016. Department of Conservation, Wellington.
[10] The PC20 Ecology Report [table 3.1, page 10] identifies the following native and exotic bird species as potentially being present based on review of databases: Morepork (*Ninox novaeseelandiae*), Pied stilt (*Himantopus Himantopus*), Silvereye (*Zosterops lateralis*), Tui (*Prosthemadera novaeseelandiae*), Black bird (*Turdus merula*), Myna (*Acridotheres tristis*), Spur-winged plover (*Vanellus miles*).

establishment of planted areas as part of the enhancement of the BHAs, the creation of landscaped buffers along Rural Zone boundaries and the compensation that is expected to be required to address residual effects on long-tailed bats. This enhancement will provide high-quality habitat for avifauna and a net gain for bird species.

Freshwater

42. Watercourses across the PC20 site are heavily modified by agricultural land use and generally degraded.

43. All watercourses were assessed and classified across the PC20 site based on the Waikato Regional Plan (WRP) definitions. Furthermore, the potential presence of any natural wetlands (as defined by the Natural Policy Statement for Freshwater Management 2020 (NPS:FM) was investigated and determined using wetland delineation protocols.[11]

44. All watercourses within the PC20 site have been classified as either artificial or overland flow paths (Figure 3 below). The artificial channels or overland flow paths ultimately flow into the Nukuhau Stream which in turn flows into the Waikato River. There are no natural wetlands within the PC20 site.

[11] Wetland delineation protocols, Clarkson. 2018, Manaaki Whenua Landcare Research and the Ministry for the Environment 2020 'Wetland Delineation Protocols'.

Figure 3: Watercourse Assessment Across the PC20 Site

45. The above watercourse assessments (including wetland assessments) were conducted over multiple occasions during April and May and after rainfall. Therefore, I have a high level of confidence that the above watercourse classifications are correct.

46. Based on the available habitat for freshwater species being restricted within the artificial channels across the PC20 site and most of the reaches being dry all year round, it is highly unlikely that any freshwater fauna is present. Therefore, it is considered that these artificial channels have low ecological value for freshwater species and the proposal has a negligible magnitude of effect and overall, very low ecological effect on freshwater fauna.

47. The above conclusion regarding freshwater is drawn based on best practice stormwater management and sediment and erosion control being implemented across the PC20 site which will avoid uncontrolled releases of sediment laden water or un-treated or un-

managed stormwater discharges into streams adjoining or in proximity of the PC20 site. Mr King addresses the stormwater management approach proposed.

48. As a summary of ecological effects on vegetation, native lizards, native birds and freshwater environments:

(a) Vegetation - a low level of ecological value and moderate magnitude of effect results in the overall level of ecological effect of low for vegetation removal (excluding potential bat roost trees). However, I expect that many trees will be planted across the PC20 site and in the surrounding area as part of the enhancement of the BHAs, the creation of landscaped buffers along Rural Zone boundaries and the compensation that is expected to be required to address residual effects on long-tailed bats. If the majority of these are native tree species and targeted at providing suitable biodiversity value, then this is likely to result in a positive magnitude of effect with the overall level of ecological effect considered to be a net gain.

(b) Native Lizards (copper skink only) - the rotating between maize and pasture across the site significantly reduces the amount of habitat availability (rank grass) for native skinks with other potential habitat across the site (rank grass, woody debris, and leaf litter) being of low value and isolated. A low level of ecological value and low magnitude of effect results in the overall level of ecological effect of very low for lizards.

(c) Native Birds - vegetation removal has the potential to directly disturb, injure or kill birds that maybe utilising the site. Native birds are particularly vulnerable to disturbance during the breeding season, when adult nesting birds, chicks, and eggs can be lost or displaced. A low level of ecological value and low magnitude of effect results in the overall level of ecological effect of very low for bird species. With the enhancement of the BHAs, the creation of landscaped buffers along Rural Zone boundaries and the compensation that is expected to be required to address residual effects on long-tailed bats, there is likely to be an overall net gain for bird species.

(d) Freshwater - artificial channels within the PC20 site have low ecological value for freshwater species and the proposal has a negligible magnitude of effect and overall, very low ecological effect on freshwater fauna.

49. Low and very low ecological effects should not normally be of concern, although normal design, construction and operational care should be exercised to minimise adverse effects.[12] Prescribed and standard mitigation measures for native birds and native lizards (copper skink only) have been incorporated into the above overall level of ecological effect. It is envisaged that mitigation measures will be part of the EMP as addressed in rule 10.4.2.14.B for native birds and native lizards (copper skinks) without the need to apply offset / compensation actions. This is also consistent with the WRPS which only requires offsetting for non-significant habitats of indigenous fauna to achieve no net loss at a regional scale where there are significant adverse effects that are unable to be avoided, remedied or mitigated.[13]

50. The below section only covers a residual effects management for long-tailed bats. I refer to Ms Cummings' evidence in terms of long-tailed bat ecological values, assessment of long-tailed bat habitat, magnitude of effect, overall ecological effect, location and enhancement of BHA's and lighting, building setback and vegetation removal standards being applied as avoidance and mitigation measures.

RESIDUAL EFFECTS MANAGAMENT APPROACH

51. Rule 10.4.2.14B in the amended provisions requires the development of an EMP for the entire Northern Precinct at the earlier of the first land use or subdivision consent (excluding boundary adjustments) application. The EMP is required to include a Bat Management Plan ("BMP") as a sub-plan of the overall EMP.

52. The BMP addresses requirements for the BHAs which are identified on the Structure Plan map to be provided, legally protected, and enhanced to avoid, minimise and mitigate ecological effects in the first instance. The information that the BMP must address includes planting specifications and an implementation programme, details of how light spill will be managed where roads cross BHAs, identification of all confirmed or potential bat roost trees and consideration of whether they can be retained based on defined criteria, tree removal protocols and monitoring details. It also must detail offset or compensation measures to contribute to a no net loss outcome where adverse effects are unable to be avoided or mitigated such that there will be more than minor residual effects on long-tailed bat habitat values. I consider that this represents an appropriate hierarchical approach which prioritises avoidance where it is appropriate and practical,

[12] Ecological Impact Assessment (EcIA) – EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems, 2nd Edition May 2018 [Page 84, para. 7].
[13] Inger EIC [para. 81].

whilst also reflecting the importance of mitigation and offset/compensation measures for managing adverse effects on long-tailed bat habitat values.

53. The EMP is also required to address measures to avoid, remedy, mitigate, offset or compensate for any adverse effects which are more than minor on habitats of other indigenous fauna, which will include native birds and copper skink.

54. I consider that the detail in the framework outlined of rule 10.4.2.14B is appropriate to provide guidance and direction at the resource consenting phase of PC20 for the appropriate management of ecological effects. The remainder of this section is to provide confidence that the residual effects management approach is feasible and within the limits that offsetting, or compensation can be applied. It is important to note that the final compensation assessment will be required to be undertaken as part of the preparation of the EMP at resource consent stage and that this preliminary assessment should not be viewed as the final offset / compensation package.

55. The residual effects management approach is focused on long-tailed bats and long-tailed bat habitat as the overall of ecological effect is considered very high[14] which is above the EIANZ threshold of moderate meaning that offset or compensation actions are required.

56. Although the RMA refers to both offsetting and compensation,[15] an offsetting approach is generally preferred over a compensation approach where residual effects are capable of being classified and quantified. In this case, offsetting was considered but it was discounted as not being appropriate for long-tailed bats in this instance due to:

(a) Compounding complexities of measuring causal and effect on long-tailed bats based on landscape interference due to their large home ranges and behavioural characteristics (using multiple roost trees over the landscape).

(b) Low level of confidence to be able achieve the quality quantitative data required for the offset models in a manageable timeframe (many years of telemetry data would be required to ascertain home ranges and habitat preferences, even then the data can be inherently 'noisy' within agricultural landscapes).

(c) Challenges in meeting offset principles such as true like-for-like without providing unintentional outcomes (such as not having the ability to trade exotic trees for native trees in restoration plans).

[14] Cummings EIC [para.83].
[15] For example, section 104(1)(ab) in relation to consideration of resource consent applications.

57. Based on the above rationale resulting in offsetting being inappropriate, a compensation approach has been adopted and is proposed. I support this approach and note that a compensation approach has also been advanced by Hamilton City Council ("HCC") for long-tailed bats for Plan Change 5 – Peacocke Structure Plan ("PC5").

58. In this instance a Biodiversity Compensation Model (BCM) has been selected as a qualitative model to test if compensation actions are likely to result in net gain biodiversity outcomes when balanced with the level of proposed impact.[16] The BCM is recognised as a reputable compensation tool used across New Zealand by ecological practitioners and their associated organisations, including HCC for PC5.

59. In this instance a BCM is considered an appropriate decision-making tool because it:

(a) allows for both quantitative and qualitative information.

(b) accounts for time lags (i.e. the time required for vegetation to establish).

(c) includes built in contingencies for

i. biodiversity risk.

ii. impact uncertainties.

iii. confidence that no net loss in biodiversity value will be achieved by using a predicted net gain threshold of 10%.

60. Mr Inger[17] provides a detailed assessment of the WRPS with relevance to ecological significance, ecological offsetting and the requirement to achieve not net loss of biodiversity value at a regional scale. I refer to Ms Cummings evidence[18] in relation to detail regarding significance for long-tailed bats but note here that although offsetting isn't being used as explained above, the BCM provides confidence that no net loss will be achieved by using a net gain threshold of 10% to account for what is termed 'false positives' (i.e. modelled outcomes not being fully released).

61. To achieve a 10% predicted net gain outcome in biodiversity over a 10-year period the residual effects management approach based on my preliminary assessment of the PC20 proposal is likely to require:

[16] A Biodiversity Compensation Model for New Zealand. Prepared by Tonkin & Taylor, dated October 2021.
[17] Inger, EIC [para. 60 – 68].
[18] Cummings, EIC [para. 63 - 71].

(a) 11ha of vegetation restoration and/or enhancement outside of the PC20 site for the purpose of establishment of commuting and foraging corridors for long-tailed bats.[19]

(b) 80ha of pest animal control over a 10-year period in areas that long-tailed bats are known to frequent.

62. Based on the BCM outputs, I consider that residual effects associated with PC20 can be compensated for by implementing the above compensation actions. To get the best biodiversity outcomes for long-tailed bats, the above compensation actions should be targeted on extending existing linear corridors that long-tailed bats use for commuting and foraging and targeted pest control in areas that long-tailed bats are known to frequent. As detailed in Mr Inger's evidence[20] the applicant has made a significant effort to secure land for compensation actions to be undertaken. I agree with Ms Cummings' assessment in her evidence that the proposed compensation site which has been conditionally purchased by the applicant is well-suited for habitat enhancement.

63. As long-tailed bats have large home ranges a co-ordinated landscape approach extending statutory boundaries would be most efficient and effective in terms of targeting restoration and pest animal control in areas that will have the best results for long-tailed bats. Mr Inger provides detail on the Waikato Regional Bat Strategy[21] and states while little weight can be given to this strategy it is encouraging that a collaborative approach is being taken. I agree with Mr Inger and consider that this strategy may be used to unlock and prioritize areas for pest animal control on public lands that developments such as PC20 can contribute to in order to benefit the local long-tailed bat population.

RESPONSE TO SUBMISSIONS RAISED

64. In this section I respond to submissions raised regarding ecological compensation.[22]

65. The above submitters main concern seems to be that a detailed offsetting / compensation approach was not included in the Ecological Report. I note that during plan change processes there are often inherent difficulties in providing absolute numbers around the quantum of impact due as detailed design has not occurred at that stage of the planning process. Therefore, it is important that provisions clearly provide a

[19] This is in addition to 4.9ha of habitat enhancement of Bat Habitat Areas ("BHA") within the PC20 site which is mitigation.
[20] Inger, EIC [para. 77].
[21] Inger, EIC [para. 133 – 138].
[22] Submitter number #20 [Department of Conservation], #23 [Hamilton City Council] and # 25 [GHA (Gerry) Kessels].

framework in which offsetting / compensation is required at the resourcing consenting stages when this information is of sufficient detail. It is my opinion that the amended provisions provide clear direction for this under policy 10.2.2.2A and rule 10.4.2.14B and address the concerns raised in the submissions.

66. As explained above, a BCM model has been developed to provide confidence that the residual effects (such as they are able to be assessed in a preliminary way at this stage) are able to be compensated for and in which I conclude that they can be. The BCM model has also been used by HCC for PC5 which may alleviate concerns raised by HCC and Gerry Kessels in their submissions that seek a consistent approach between PC20 and PC5.

67. In order not to pre-empt outcomes of detailed design and future resource consents, I believe that the approach in the amended provisions take is correct in providing a framework in which offset / compensation for residual effects can be applied. This is important as it provides an incentive for the detailed design to further reduce ecological impacts and that best practice tools offset / compensation tools are used at the time of resource consenting.

JOINT WITNESS STATEMENT (JWS) IN RELATION TO ECOLOGY AND BAT HABITAT

68. While I attended conferencing on the above topic, my contribution was limited to matters relating to general ecology and offset / compensation. For all other matters relating to long-tailed bats I refer to Ms Cummings' and Mr Inger's evidence.

69. Ms Cummings, Mr Kessels and I all agreed that based on the information supplied to date and knowledge of the PC20 site that there are no freshwater values to consider.[23]

70. It was also agreed between Ms Cummings, Mr Kessels and I that any offset / compensation applied in relation to long-tailed bats would have a positive trickle-down effect for other species (namely native birds and native lizards).

71. I consider that this is an important point as the offset / compensation approach is unlikely to focus on native birds or lizards due to level of overall ecological effect being less than moderate as per the EIANZ guidance.

72. Ms Thurley has recorded in the JWS Ecology and Bat Habitat that best practice effects management should be followed. I believe that this has been adequately addressed

[23] JWS in Relation to Ecology and Bat Habitat – 8 February 2023 [3.1.1 para 4].

within the amended provisions, particularly through the identification of BHAs on the amended structure plan.[24]

73. The JWS Ecology and Bat Habitat also records Ms Cummings and Mr Kessels support for the use of the 11ha property as a proposed offset / compensation site, although Mr Kessel's agreement is on the premise that more detail is supplied on the certainty that it will be suitably restored and protected and subject to his review of an additional residual effects assessment.

74. While I have provided a preliminary assessment of the expected residual effects in my evidence, I consider that it is appropriate for the final details of the compensation to be provided and approved at resource consent stage through the EMP (including the BMP) as required by rule 10.4.2.14B. This is not unusual for the plan change stage, as I understand to be the case with the compensation requirements for PC5. That said, the conditional purchase of the proposed compensation site by the applicants provides a higher level of confidence in the likely compensation actions than may otherwise typically exist at this point in a plan change process.

RESPONSE TO THE SECTION 42A REPORT

75. I have read the Section 42A Report with specific reference to section 9, sub-topic 2.2 – Bat Habitat / Biodiversity in regard to matters relating to general ecology and compensation.

76. The Section 42A Report recommends acceptance of the amended provisions in full with respect to ecology matters and no additional matters have been raised or recommendations made above the matters that I discuss above.

CONCLUSION

77. I consider the ecological values and effects on matters relating to general ecology for PC20 have been adequately identified and addressed through the PC20 Ecology Report and within the above evidence. I have also had regard to Ms Cummings' evidence in relation to long-tailed bats.

78. I consider that adverse effects from PC20 on vegetation, native birds, native lizards and freshwater fauna will be low or very low. I expect that there will be net gains for vegetation

[24] JWS IN Relation to Ecology and Bat Habitat – 8 February 2023 [3.1.2 para 10].

and avifauna due to the extensive enhancement and restoration that will be required to address effects on long-tailed bats.

79. For long-tailed bats, it is my opinion that the amended provisions take the correct approach by providing a framework in which offset / compensation for residual effects can be applied at the resource consenting stage.

80. I consider my preliminary assessment of the compensation package, combined with the conditional purchase of the proposed compensation site by the applicants, provides a higher level of confidence in the likely compensation actions than may otherwise typically exist at this point in a plan change process.

81. In conclusion based on the updated provision and matters set out and discussed above, I am supportive of PC20 as it relates to general ecology and offset / compensation matters.

Josh Markham
Tonkin Taylor Ltd

28 February 2023