BEFORE THE HEARING PANEL

IN THE MATTER OF	The Resource Management Act 1991 ("the Act")
and	
IN THE MATTER OF	an Application by Weston Lea Limited for land use and subdivision consents for the development of approximately 105 hectares of land at 337 – 461 Peacockes Road, Hamilton
AND	
IN THE MATTER OF	a submission on this application by the Director-General of Conservation.

STATEMENT OF EVIDENCE OF LAURENCE BAREA
FOR THE DIRECTOR-GENERAL OF CONSERVATION
23 April 2019

Department of Conservation

Private Bag 3072, Hamilton 3240

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Submission Number: 59

1. Introduction

1.1. My full name is Laurence Peter Barea. I hold Bachelor of Science (1991) and Master of Science (1st Class honours) (1995) degrees from the University of Waikato and a PhD (2008) in Terrestrial Ecology from Charles Sturt University, NSW, Australia. I am employed as a Technical Advisor in ecology, with a focus on biodiversity offsets, with the Department of Conservation (the Department) in Hamilton.

1.2. I have been asked to provide expert evidence on the approach the applicant, Weston Lea, has taken to manage adverse effects of the development, including that of residual adverse effects. I am familiar with the proposed application by Weston Lea Ltd and visited the site in March 2019.

1.3. I have been in my current role since 2012. Between February 2010 to 2012, I was a senior environmental consultant with Golder Associates (NZ and Canada) Limited. Prior to that I was an Ecologist and Biodiversity Technical Support Supervisor for the Waikato Conservancy of the Department. Between 2001 and 2004 I worked as a consulting wildlife biologist in Boise, Idaho on a range of development projects across the Pacific Northwest of the United States of America before moving to Australia in 2004 to undertake my Doctoral research in terrestrial ecology. Between 1996 and 1998 I worked for the Department as a wetland and threatened species ecologist. I have published ten scientific papers in the peer reviewed literature, including on the subject biodiversity offsets. I am a member of the New Zealand Ecological Society.

1.4. I have acted as an expert witness on biodiversity offsetting in relation to the Hauāuru mā Raki (HMR) Wind Farm, the Hurunui Water Project, Oceana Gold Coronation Extensions (Phases I and II), Mt Messenger Bypass, the Auckland Unitary Plan, South Taranaki District Plan, Queenstown Lakes District Plan, Thames Coromandel District Plan, Dunedin City Plan, Buller District Plan (proposed plan changes 133 – 145), and the Kapiti District Plan.

1.5. In my current role I provide technical advice to the Director-General and associated decision makers on the mitigation hierarchy, biodiversity offsets, environmental compensation and their development and assessment. Prior to its formal closure in 2018, I represented the Department on the Advisory Group to the international Biodiversity and Business Offsets Programme (BBOP).

2. Code of Conduct

2.1. While this is not an Environment Court hearing, I have read the Environment Court's Code of Conduct for Expert Witnesses, and I agree to comply with it. I have prepared this Statement in accordance with that code and I confirm that the issues addressed in this brief of evidence are within my area of expertise.

2.2. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed. I have specified where my opinion is based on limited or partial information and identified any assumptions I have made in forming my opinions.

3. Key Facts and Opinions

3.1. The terrestrial ecological values of the Amberfield site include the confirmed or probable presence of and habitat for long-tailed bats, lizards, avifauna and indigenous vegetation. I am comfortable that with appropriate management adverse effects to lizards, avifauna and indigenous vegetation can be addressed. This is not in my opinion the situation for long-tailed bats.

3.2. The ecological work conducted by the Applicant confirms that the Amberfield site is used by long-tailed bats for at least, roosting, foraging and commuting within the landscape. The adverse effects of the subdivision are assessed by the Applicant, Mr Kessels, Ms Pryde and Dr Borkin as more than minor and potentially significant by the latter four witnesses.

3.3. The Applicant has in my opinion not designed the proposed subdivision in a manner that avoids adverse effects to long-tailed bats, as it should have. In attempting to address adverse effects the Applicant has not followed a mitigation hierarchy but rather addressed them with management options that its own witness, Dr Parsons has stated to be uncertain of outcome. This view is similar to that of Ms Pryde and Dr Borkin.

3.4. An offset is not able to demonstrate no net loss for long-tailed bats because there is insufficient data to support robust offset development, limits to offsets are breached and the proposed management in uncertain in its effect.

3.5. In my opinion the proposal should avoid adverse effects to long-tailed bats and to that effect I support Mr Riddell's recommendation that it be redesigned to that effect supported by conditions that suitably address detail, specificity, certainty, clear articulated goals and intended outcomes, appropriate management methods, a full suite of measurable performance targets and adaptive responses if targets are not met.

4. Scope of Evidence

4.1. My evidence covers the management of adverse effects for terrestrial ecology, namely long-tailed bats (*Chalinolobus tuberculatus*), lizards, avifauna and indigenous vegetation. I provide particular focus on the Nationally Critical long-tailed bat due to its very high conservation concern and use of the Amberfield site as part of the wider landscape. Specifically, I cover the following topics followed by my recommendations and conclusion;

a) The Business and Biodiversity Offsets Programme
b) The BBOP Biodiversity Offset Principles
c) Guidance on Good Practice Biodiversity Offsetting in New Zealand
d) Local Government Offsetting Guidance

e) Biodiversity Offsets Definition
f) Biodiversity Offsetting and other forms of Effects Management
g) Environmental Compensation v Offsets
h) Mitigation v offsets and compensation
i) No Net Loss
j) The Mitigation Hierarchy
k) Adverse Effects to Long-tailed Bats
l) The Importance of Amberfield to Long-tailed Bats and Avoiding Loss.
m) Joint Witness Statement
n) Limits to Offsets, Environmental Compensation and Mitigation
o) Section 42A Report
p) Assessment of Applicant's Proposed Conditions

5. Matters Considered

5.1. My opinions rely in part on the Evidence in Chief presented by expert witnesses appearing for Weston Lea Ltd, in particular the following statements of evidence and reports:

1. Assessment of environmental effects: Amberfield application for subdivision and land use consents for development.
2. Boffa Miskell (2018) Amberfield - Peacocke Structure Plan, Terrestrial
   Ecological Assessment, 15 May 2018.
3. Assessment of Environmental Effects: Addendum Received 26 February 2019.
4. Amberfield - Peacocke Structure Plan: Terrestrial Ecological Assessment (Boffa Miskell 2018).
5. Memorandum to Weston Lea Ltd: Amberfield project - Hamilton City Council section 92 response. Terrestrial ecology 16 August 2018.
6. Amberfield: Ecological Assessment Addendum. Report prepared by Boffa Miskell for Weston Lea Ltd (Boffa Miskell 2019).
7. Amberfield project – Hamilton City Council s92 response. Terrestrial ecology.

8. Crewther K. and Parsons S. 2017: Predictive modelling of long-tailed bat distribution in the Hamilton area. Walking bats Consultancy report. Prepared for Project Echo.
9. Ecologist's Joint Witness Statement February 22, 2019
10. Ms Georgia Cummings
11. Mr Andrew Blaney
12. Dr Stuart Parsons

5.2. My opinions are also informed by the Section 42A report and associated evidence of Mr Gerry Kessel, and the evidence of Ms Moira Pryde, Dr Kerry Borkin and Mr Andrew Riddell.

6. The Business and Biodiversity Offsets Programme

6.1. The Business and Biodiversity Offsets Programme (BBOP; http://bbop.forest-trends.org/*)*, was an international collaboration of more than 80 organizations and individuals including companies, financial institutions, government agencies and civil society organizations.

6.2. The BBOP's vision and expectation is that biodiversity offsets will become a standard part of business practice for those companies undertaking activities with a significant residual effect on biodiversity after avoiding, remedying, and minimising effects; and that the routine mainstreaming of biodiversity offsets into development practice will result in long-term and globally significant conservation outcomes.

6.3. Since its inception in 2004, New Zealand has been a key contributor to the BBOP programme with members from the Department, extractive industry and legal profession contributing to the work. In December 2018, the BBOP closed after 15 years of developing guidance and influencing international policy and practice concerning the application of the mitigation hierarchy, and its final steps, biodiversity offsets and environmental compensation.

6.4. The BBOP established key definitions and a principles-based approach to biodiversity offsetting (BBOP 2012a). These principles underpin the concept of biodiversity offsetting, support its definition and form the standard to

inform the design, implementation and assessment of a biodiversity offset. Many of these principles are also applicable to environmental compensation.

6.5. International organisations are increasingly incorporating BBOP principles and guidance into their sustainable business policies to manage reputational, social and environmental risk. Examples include the International Finance Corporation arm of the World Bank, 83 international banking institutions in 36 countries adopting the Equator Principles, the International Union for the Conservation of Nature (IUCN), and the European Union No Net Loss Initiative, amongst others. This broad international accordance, in my opinion, supports a conclusion that the BBOP standard, guidance and principles are biodiversity offsetting good practice.

7. The BBOP Biodiversity Offset Principles

7.1. The BBOP (BBOP 2012) developed ten principles that are expected to be met for a project to be considered a biodiversity offset. The principles underpin offset design and implementation and provide a foundation for expected outcomes from a biodiversity offset. They recognise both ecological equivalence and social interest in biodiversity, and acknowledge that societal wellbeing is eroded when biodiversity is lost.

7.2. The BBOP principles are:

a) Adherence to the mitigation hierarchy: A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimisation and on-site rehabilitation measures have been taken according to the mitigation hierarchy.

b) Limits to what can be offset: There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.

c) Landscape context: A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity and supporting an ecosystem approach.

d) No net loss: A biodiversity offset should be designed and implemented to achieve in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity.

e) Additional conservation outcomes: A biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations.

f) Stakeholder participation: In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, implementation and monitoring.

g) Equity: A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognised rights of indigenous peoples and local communities.

h) Long-term outcomes: The design and implementation of a biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and preferably in perpetuity.

i) Transparency: The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.

j) Science and traditional knowledge: The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.

8. Guidance on Good Practice Biodiversity Offsetting in New Zealand

8.1. In response to an increasing number of proposals involving offsets, where consistency of approach and a standard were lacking, the Department led a cross government department initiative to develop biodiversity offsetting guidance between 2009 and 2014. The intention of the New Zealand Government Guidance (NZ Guidance; https://www.doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting/) was to ensure that solutions addressing residual effects are ecologically sound and demonstrably result in no net loss or a net gain. The NZ Guidance is contextually related to Goal 3 of the New Zealand Biodiversity Strategy (2000), which is to halt the decline in New Zealand's indigenous biodiversity.

8.2. The NZ Guidance is New Zealand's implementation of BBOP's international work. It was developed under the auspices of the Department's Biodiversity Offsetting Programme, with participation of the Ministry for Business, Innovation and Employment, Ministry for the Environment, Land Information New Zealand and the Ministry for Primary Industries.

8.3. The New Zealand Programme has drawn from the work of the BBOP, including adoption of the ten principles, to the extent that the NZ Guidance is essentially the New Zealand embodiment of that work.

8.4. The NZ Guidance was formally launched by the Minister of Conservation on 7 August 2014. Although the NZ Guidance is not a statutory document it is a valuable tool for the design and assessment of ecologically sound management of adverse effects and reflects the relevant government departments' view on biodiversity offsetting. It is supported by additional

resources that provide more detail on the design, implementation and assessment of biodiversity offsets.

9. Local Government Offsetting Guidance

9.1. In September 2018 the Regional Councils BioManagers Group released its guidance 'Biodiversity Offsetting under the Resource Management Act'. The purpose of this Local Government Guidance (LG Guidance; https://www.lgnz.co.nz/our-work/our-policy-priorities/3-environment/biodiversity/) is to provide councils and resource consent applicants with guidance on applying biodiversity offsets under the RMA. The document draws on international best practice informed by BBOP and was designed to be consistent with the NZ Government Guidance.

10. Biodiversity Offsets Definition

10.1. Biodiversity offsetting refers to a process that seeks to counter-balance the unavoidable effects of activities on biodiversity by enhancing the state of biodiversity at a site other than the affected site. The NZ Guidance draws from the BBOP definition of biodiversity offsetting to define a biodiversity offset as:

> *Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground.*

10.2. The LG Guidance definition is functionally similar, but extends offsets to all residual adverse effects, and is as follows;

> *A measurable conservation outcome resulting from actions designed to compensate for residual, adverse biodiversity effects arising from activities after appropriate avoidance, remediation, and mitigation measures have been applied. The goal of a biodiversity offset is to achieve no-net-loss, and preferably a net-gain, of indigenous biodiversity values.*

11. Biodiversity Offsetting and other forms of Effects Management

11.1. In any activity there is usually a range of measures presented by the applicant to address adverse effects on the environment. It is usual that a mixture of solutions will be tabled: from avoiding, remedying and mitigating certain adverse effects through to actions addressing the loss of residual ecological values which cannot be avoided, remedied and mitigated.

11.2. The range of management options for these residual effects might be seen as existing along a continuum representing increasing confidence that no net loss or a net gain can be demonstrated in support of its practical achievement on the ground. Figure 1.

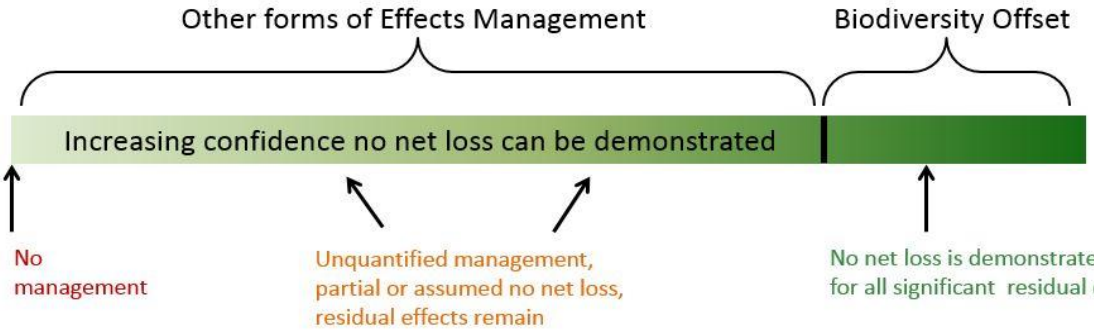

Figure 1. Impact Management Spectrum (after BBOP 2012).

11.3. At the extreme left of the Figure, and under little or no investment in effects management, there is low confidence that no net loss can be demonstrated. With increased investment in identifying adverse effects and management options, outcomes improve, but biodiversity losses and gains may remain un-quantified (how much has been lost and gained?), different types of biodiversity are exchanged for those lost (e.g., rat control for vegetation loss), and residual effects often remain.

11.4. A biodiversity offset is indicated at the point along the spectrum where no net loss or a net gain is demonstrated to be achievable on

the ground. How this is calculated and demonstrated is critical to understanding what no net loss means for a specific project.

12. Environmental Compensation v Offsets

12.1. Environmental compensation often comprises a range of offerings, from financial payments to specific management actions aimed at improving habitats or species populations, or both. While both biodiversity offsets and environmental compensation can provide positive environmental effects, the critical difference is that environmental compensation is not designed to demonstrate, a priori, that no net loss or a net gain in biodiversity is achievable on the ground. Thus, the outcomes of environmental compensation differ from those of biodiversity offsetting and contain more risk as to a successful outcome for biodiversity when applied without the rigour of the biodiversity offsetting process.

12.2. A useful definition for environmental compensation is as follows:

> *"Actions offered as a means to address residual adverse effects on the environment arising from project development where no net loss or net gain of biodiversity on the ground is not intended or able to be measured."*

12.3. Thus, biodiversity offsets are differentiated from other forms of effects management, including environmental compensation, by requiring two essential components:

a) Explicit measurement and balancing of biodiversity predicted to be lost and gained;
b) A goal of no net loss and, preferably, a net gain of biodiversity to be reasonably demonstrated and then achieved on the ground.

12.4. In order for biodiversity offsets to be sound, their design should incorporate these essential components and transparently

communicate how that has been achieved. Doing so clearly distinguishes an offset from environmental compensation.

12.5. In my opinion both biodiversity offsets and environmental compensation can provide positive effects on the environment but how they are developed is critical to their success. The LG Guidance provides caution around the use of environmental compensation because of the higher risk of poor biodiversity outcomes relative to offsetting and is the last resort in the effects management hierarchy (see discussion on effects management hierarchy below).

12.6. Avoiding conflating the two concepts is critical to understanding an overall approach to managing adverse effects to the environment, risks and outcomes and how they are demonstrated to be achievable.

13. Mitigation v offsets and compensation

13.1. I have frequently observed biodiversity offsetting or environmental compensation being confused with mitigation. The High Court in RFBPS v Buller District Council [2013] NZHC 1346 held that under the RMA, offsets are not mitigation (in the sense of the usual meaning of mitigation being to alleviate, or to abate, or to moderate the severity of something) and do not address effects at the point of impact; rather, they are better viewed as a positive environmental effect and are able to be taken into account under section 104(1)(a) and section 5(2). The RMA has now been amended to specifically allow consideration of any measure proposed or agreed to by an applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects that may result from allowing that activity.

13.2. The High Court decision referred to above is helpful because it clarifies the distinction between mitigation and offsets. Throughout my evidence I refer to mitigation, offset and environmental compensation using this distinction.

13.3. Thus, any actions aimed at addressing adverse effects of this application that occur at a location away from the impact site should not be considered mitigation. Additionally, any actions intended to alleviate, or to abate, or to moderate the severity of adverse effects at the impact site are mitigation, in accordance with the High Court ruling [NZHC 1346].

14. No Net Loss

14.1. No net loss is the essence of biodiversity offsets. It is the goal of an offset. In its absence, management of effects becomes simply a collection of actions lacking an explicit outcome. No net loss refers to the point at which biodiversity gains from targeted biodiversity management activities match the losses of biodiversity due to the effects of a specific activity, and essentially means no overall reduction in indigenous biodiversity, as measured by type, amount and condition. A net gain means that biodiversity gains exceed a specific set of losses associated with an activity.

14.2. Under the NZ Guidance and LG Guidance, a biodiversity offset should be designed and implemented to reasonably demonstrate that no net loss and, preferably, a net gain of biodiversity can be achieved.1 Demonstrating no net loss involves explicit identification and quantification of biodiversity losses and gains and their balancing in an accounting system. This requires, amongst other factors, that the adverse effects leading to residual losses are well understood and management methods are available that are known to produce similar gains and both are quantified with adequate data.

14.3. In order to balance losses and gains, biodiversity must be translated into a currency. This provides the basis for exchange and describes 'how much of what' is being lost and gained. It essentially defines the

[1] The preference for a net gain over no net loss reflects the risk to biodiversity associated with its certain loss for uncertain gain, and reduces some of the uncertainty around accurate quantification of biodiversity and its future management.

meaning of no net loss on a case by case basis. The mathematical balancing of the currency across affected and offset site demonstrates (i.e. not assumes) the point of no net loss.

14.4. The concept of like for like is inseparably linked to no net loss. This is because, as the degree of dissimilarity between the biodiversity being lost and gained increases, the more difficult it becomes to replace all the components lost because they may not exist at the offset site. As such, demonstrating and then achieving no net loss requires like for like biodiversity exchanges.

14.5. The take home message is that the design of a biodiversity offset needs to be informed by adequate data and other information necessary to provide confidence that similar gains can be created to balance losses. Without a data informed design process, it is not possible to demonstrate with a reasonable level of confidence that no net loss can be achieved.

15. The Mitigation Hierarchy

15.1. The principle of following the mitigation (effects management) hierarchy before applying biodiversity offsets or environmental compensation is fundamental to biodiversity outcomes when it is lost to subdivision and other development. The principle is advocated by BBOP, internationally accepted as good practice and is increasingly being incorporated into statutory planning instruments across New Zealand, including within Policy 11.2.2 of the operative Waikato Regional Policy Statement (WRPS).

15.2. The hierarchy consist of first avoiding, remedying and mitigating adverse effects before considering biodiversity offsetting and environmental compensation. Following this process is critical to ensuring that adverse effects are reduced and made transparent so that residual adverse effects are as small as reasonably possible before offsets or compensation are applied. This ensures that offsets or compensation are not inappropriately used to address adverse effects that could otherwise be managed earlier in the hierarchy. It also

reduces their cost and the likelihood of failure when residual effects are large or their management is intractable with available technology or resources.

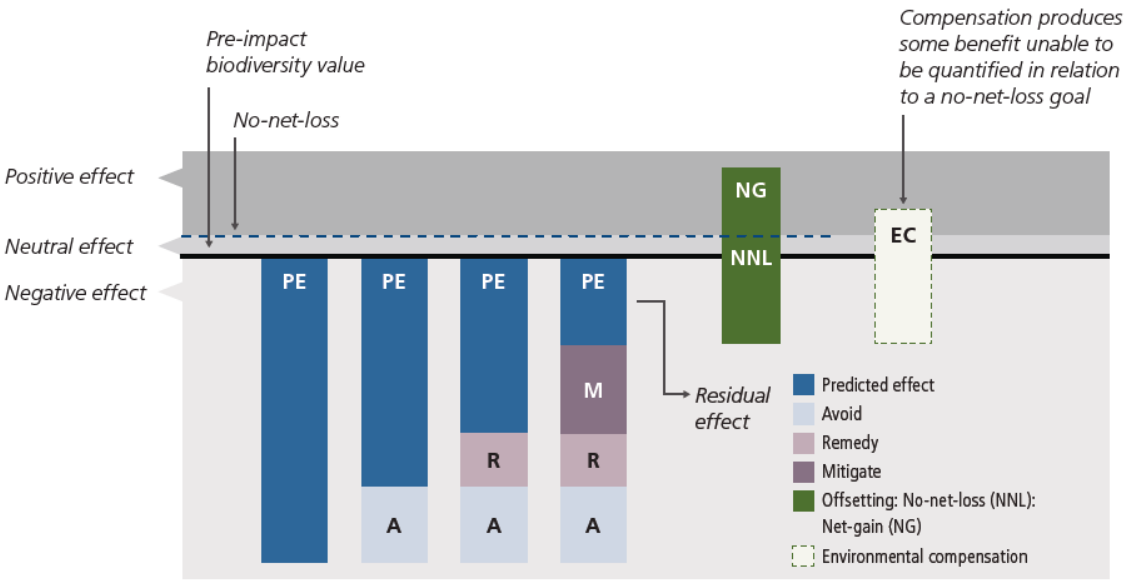

Figure 2. Conceptual illustration of the effects management hierarchy progressing from avoidance (least risk and most certainty) to environmental compensation (greatest risk and least certainty) and showing the difference between a 'no-net-loss' and positive 'net gain' outcome. The no-net-loss line is above the pre-impact biodiversity value as more gains than losses are required to achieve no-net-loss when accounting for uncertainty and time-lags. (source: LG Guidance 2018).

15.3. The most important step in the effects management hierarchy is that of avoiding adverse effects in the first instance, in particular when environmental values are high and/or difficult to manage, such as is the case with long-tailed bats. Avoiding adverse effects can be achieved at a range of spatial scales through careful project design after biodiversity values at the site have been identified and adequately understood. In the case of this application, I am of the opinion that a greater emphasis on avoiding adverse effects to long-tailed bats must occur if the risk of population level adverse effects referred to by Ms Pryde and Dr Borkin are to be addressed.

16. Adverse Effects to Long-tailed Bats

16.1. All the ecological witnesses addressing long-tailed bats in this case consider that the proposed activity results in adverse effects to this Nationally Critical species and Mr Kessels, Ms Pryde and Dr Borkin consider that they may be significant. After my consideration of the approach to managing adverse effects and the level of certainty that the measures will be successful, I agree that the adverse effects may be significant for long-tailed bats. Ms Pryde succinctly states in her evidence that the adverse effects on bats will be as follows;

a) disturbance, direct deaths, injury, displacement through felling of roost trees during the construction.

b) loss and fragmentation of feeding habitat and shelter within the proposed sub-division.

c) potential loss of critical present and future breeding roosts leading to significant adverse effects which may threaten the viability of the Hamilton population of bats.

d) increased noise and the introduction of permanent lighting in the sub-division impacting on the feeding, foraging, drinking and commuting of bats.

e) impacts of construction (noise, lighting, vibration) on feeding.

f) impacts of increased traffic on bats.

17. The Importance of Amberfield to Long-tailed Bats and Avoiding Loss

17.1. Dr Parsons refers to the importance of the Amberfield site in paragraphs 49–59 of his evidence. In paragraph 55 he states that “the value of Amberfield to the long-tailed bats is as a corridor that facilitates movement of bats between gully systems and the river.” The value of the site to long-tailed bats is more than functioning as a corridor, and

also includes foraging and roosting, the latter being discovered after the application was lodged.

17.2. I agree with Dr Parson's that the site's function as a corridor links indigenous ecosystems and habitat fragments and is important for retaining connectivity between them. Loss of this function should be avoided because if not, its loss would result in functional fragmentation of long-tail bat habitat and could isolate bats from their habitat in the Mangakotukutuku Gully system. That would be a significant adverse effects that could lead to irreversible population level adverse effects.

17.3. Dr Parsons goes on to say in the following paragraph that the river and its riparian margins, the east-west shelterbelt and the southern gully facilitate this movement. All either act as - or have potential to act as - movement corridors and loss or degradation of this function must be avoided, in my opinion.

17.4. Dr Borkin provides evidence for the importance of Amberfield for long-tailed bats in terms of recorded numbers. In paragraph 37 of her evidence she refers to thermal imaging studies at six sites along the river, where 68% and 81% of bat detections in 2017 and 2018 respectively, were located at Amberfield. In my opinion, activities that reduce the presence or activity of bats along the river adjacent to the Amberfield site should be avoided.

17.5. The Amberfield site however is also important for roosting. In her evidence at paragraph 33, Dr Borkin states that she does not support the assumption that Hammond Park is of higher value to bats than Amberfield. She cites recent radio-tracking confirmed three roosts at the Amberfield subdivision, compared to one roost within Hammond Park. That roost was detected by the Department during radio tracking along the river. The location of the roost was followed up with the Applicant's ecologists and its location confirmed. The likely presence of other roosts is acknowledged by the Applicant.

17.6. Unfortunately, because the Applicant did not follow up with emergence counts to determine whether the roost was being used by

a single or multiple bats, the multiple statements in Ms Cummings evidence referring to the roost involving only a solitary bat, and that other roosts are likely also solitary, is not supportable. In paragraph 1 (f) of his evidence, Dr Parsons states that the significance of the roost being difficult to determine at this stage and there is no evidence to suggest that Amberfield is a breeding site for bats. Had the Applicant conducted emergence counts to determine if other bats were also using the roost, the significance of the roost might be less problematic to determine. That they didn't do that contributes to the lack of evidence to confirm whether Amberfield is, or is not, a breeding site for bats.

17.7. Notwithstanding the status of the roost, in my opinion its loss should be avoided as part of implementing the first step in the mitigation hierarchy rather than relying on the uncertainty of planting new habitat and associated time lags before it is functionally useable or placing artificial roost boxes along the river.

17.8. It is concerning that the group of large trees to the west of the confirmed roost was not monitored for bat activity during the main monitoring periods because the monitoring device failed (Bat 01 Map 2 Annexure C, Ms Cummings evidence). This is concerning because the closest device to the roost detected by the Department also failed to operate which probably contributed to the non detection of an occupied roost at Amberfield (Bat 01 Map 2 Annexure C, Ms Cummings evidence). This is important in an adverse effects management context because it means that roosts may be present but remain undetected which risks their loss when that could have been avoided.

17.9. In the landscape within which the Amberfield is sited, suitable roosts are increasingly becoming a limited resource due to multiple development pressures, including this one which proposes to remove a roost. Dr Borkin cites in her evidence at paragraph 53 research confirming that each individual old tree is likely important because of the high fidelity to individual trees as roosts. Her view is that consequently, each known roost within the Hamilton area is likely to be of high value to the local bat population, and therefore should be

protected. I agree and consider that good practice of adverse effects management would recognised the importance of roosts and potential roosts to the long-tailed bat population and ensure that project design avoids any loss.

17.10. Policy 11.1 of the WRPS contains a particular focus on working towards achieving no net loss of indigenous biodiversity at a regional scale. To achieve no net loss requires like-for-like biodiversity exchanges in order for biodiversity losses and gains to be exchanged and balanced on an ecologically equivalent basis. Because like-for-unlike exchanges cannot be balanced in the same way, they result in the loss of the impacted value and gain in something different. It is important for decision makers to understand this because a biodiversity offset designed and implemented in a manner consistent with the international guidance developed by BBOP or the NZ Government and LG Guidance that could contribute to the demonstration of no net loss. In fact, the Applicant acknowledges that it is uncertain whether the proposed management can deliver its own intended outcomes, let alone no net loss.

17.11. The Hamilton District Plan contains an objective (20.2.1) for Significant Natural Areas providing for significant natural areas to be protected, maintained, restored and enhanced.

The policies supporting objective 20.2.1 include the following which require avoiding the following adverse effects, all of which are applicable to long-tailed bats using the Amberfield site.

a) Policy 20.2.1e The reduction, fragmentation and isolation of indigenous ecosystems and habitats shall be avoided.

b) 20.2.1f The loss or disruption of corridors or connections linking indigenous ecosystems and habitat fragments shall be avoided.

c) 20.2.1g The loss or disruption to migratory pathways in water, land or air shall be avoided.

18. Joint Witness Statement

18.1. I attended joint expert caucusing on February 18, 2019, prior to an active bat roost being discovered on the Amberfield site and the Applicant's evidence being available. During that caucus all experts in attendance agreed that the adverse effects of this proposal should be managed through the hierarchical and sequential process below and recorded agreement in the Joint Witness Statement attached to this evidence (JWS 2019).

1. Avoidance
2. Remediation
3. Mitigation
4. Offset
5. Compensation

18.2. In my opinion, the Applicant's proposal does not follow the approach agreed to in the JWS. Because the application does not avoid adverse effects to long-tailed bats it results in those effects being larger than they could be otherwise, and their management is inappropriately pushed to lower levels of the hierarchy, which transfers the risk to bats. Additionally, the high uncertainty associated with proposed management actions, acknowledged by the Applicant (Dr Parsons paragraph 82; and the Department, leads to a lack of confidence that the measures can provide their intended outcome, resulting in unacceptable risk for this critically threatened species.

18.3. The uncertainty of onsite management of adverse effects to long-tailed bats is again acknowledged by the Applicant in the Terrestrial Ecological Assessment, dated 15 May 2018 which states that options are not available to meaningfully and fully mitigate for the overall habitat and flight corridor losses to long-tailed bats onsite.

18.4. Accordingly, in my opinion the adverse effects of this application are likely to be significant for long-tail bats.

18.5. With respect to managing adverse effects to vegetation (other than known or potential bats roosts), avifauna and lizards, I am comfortable that with appropriate re drafting of proposed conditions, the adverse effects can be managed to an acceptable level.

19. Limits to Offsets, Environmental Compensation and Mitigation

19.1. Limits to offsets is a BBOP principle reflected in the NZ Government and LG Guidance. It is critical for any application to consider limits because reaching a limit directly influences the success of offset or environmental compensation. In my opinion this principle is also relevant to measures intended to reduce the level of adverse effects, such as mitigation actions occurring at an impact site. Ultimately, assessing limits is akin to asking, will the measures actually work? Attempting to apply these approaches to adverse effects where there is low confidence of success presents a high risk of poor environmental outcomes. Assessing limits includes evaluating the following;

a) conservation value, i.e. irreplaceability and vulnerability of the affected biodiversity; and

b) the likelihood that the proposed actions will be successful.

19.2. For long-tailed bats the New Zealand Threat Classification System (NZCTS) provides an assessment of the vulnerability by considering historical decline, current threats and population trajectories and assigns the highest level of threat classification available, Nationally Critical. Irreplaceability increases with threat status because there are fewer locations available where the species exists naturally. In my opinion this level of vulnerability means that adverse effects should be avoided.

19.3. The likelihood of success of a biodiversity offset or environmental compensation is influenced by:

a) The magnitude of the adverse effect — the severity, extent and duration of effect. For long-tailed bats the subdivision risks a permanent loss of habitat and reduction in habitat connectivity and population isolation, although uncertainty is high with respect to severity. Against the background trend of population decline, such an outcome further risks local extinction.

b) The opportunity to manage at another suitable site — the availability of site where comparable, additional and lasting management actions can be delivered. The applicant has not attempted to investigate opportunities to address residual adverse effects to long-tailed bats offsite and is not willing to attempt to do so (Ms Cummings evidence paragraph 82).

c) The feasibility of delivering the goal — the ability of the management actions to deliver required gains. This requires demonstrated evidence that the proposed techniques (whether onsite or offsite) can deliver the required outcome (i.e. they are known to work), that there is sufficient technical capability available, provision for timely commencement of goal delivery to minimise time lags and availability of long-term financing until goals are achieved. Dr Parsons has acknowledged, citing literature that similar approaches have not been attempted in NZ or overseas (paragraph 82 in his evidence), that the outcome of onsite management approaches are uncertain. This uncertainty is also acknowledged in the S42A report and associated evidence of Mr Kessels as well as in the evidence of Ms Pryde and Dr Borkin.

19.4. The conservation value of long-tailed bats is clearly very high based on its NZCTS classification of Nationally Critical. The resource management implications of highly valued biodiversity is recognised in policy 11.2.2(f) of the WRPS which requires councils to recognise that remediation, mitigation and offsetting may not be appropriate where the indigenous biodiversity is rare, at risk, threatened or irreplaceable. This in my opinion places particular emphasis on avoiding adverse effects

in the first instance through appropriately informed and sensitive project design. In my opinion that has not occurred.

19.5. When the combined assessment of conservation value and likelihood of success are considered, it is my opinion that the design of the subdivision cannot, with reasonable certainty, be managed to an acceptable level because limits to mitigation, offsets or compensation are reached.

20. Section 42A Report

20.1. The s42A report draws on the evidence of Mr Kessels to develop conditions to manage adverse environmental effects. I support the general approach for terrestrial values other than long-tailed bats but consider the conditions are inadequately drafted and create risks to biodiversity after a consent might be granted. Because the Applicant has reflected the s42A recommended conditions, these issues have been incorporated into its own proposal. To avoid repetition I discuss these inadequacies in paragraphs 20.2–20.5 below.

20.2. I disagree with Mr Kessels when he states in paragraph 23 of his evidence that he does not "consider these residual effects to be so significant that avoidance is the only option available". Mr Kessels appears to assume that management can address potentially significant adverse effects when there is no evidence in the literature or provided by the Applicant that they actually work. This is important because he goes on to state "that the Amberfield Development will create adverse effects in the short to medium term which could be significant and potentially result in a loss of habitat utilisation and a reduction of the long-tailed bat population within southern Hamilton." These views have influenced the s42A report and recommended conditions. As I have stated several times above, it is my opinion that adverse effects to long-tailed bats should be avoided rather than managed, in particular when the uncertainty of management outcomes has been so widely acknowledged.

20.3. The s42A report recommends condition 67 to develop an Environmental Management Plan (EMP) with the objective to "demonstrate how the Consent Holder intends to avoid, remedy, mitigate, offset or compensate terrestrial biodiversity values". I have reviewed the Applicant's proposal and am of the opinion that, notwithstanding the issue of limits to offsets discussed above, the information collected by the Applicant falls substantially short of that necessary to design an offset, or indeed, robust environmental compensation or mitigation with a high likelihood of success for long-tailed bats. The shortfall relates to both the use of the site by bats and its context in the wider landscape.

20.4. The overall insufficiency of information in this respect is highlighted by Dr Borkin, Ms Pryde and Mr Kessels in their briefs of evidence as well as being recorded as the view of myself, Ms Pryde and Dr Stirnemann in the Joint Witness Statement dated February 22, 2019. With respect to confidence in the management approaches both bat ecologists for the Applicant, Dr Parsons and Ms Cummings, cite uncertainty in the level of effect and likelihood of success of management of adverse effects.

20.5. Consequently, I am of the opinion that the application cannot achieve no net loss for long-tailed bats and therefore an offset cannot be developed. This is in contrast to the view of Mr Kessels, who states at paragraph 87 in his evidence states that, "given the uncertainty surrounding the magnitude of the ecological effects on long-tailed bats, the use of some form of agreed approach is an appropriate response when developing a robust and defensible offset/compensation mitigation package".

20.6. I disagree. Offsets are not the result of negotiated agreed approaches, which often suffer from diverse motivations and trade-offs as parties attempt to find common ground. Rather, and as I have detailed in paragraphs, 13.1–13.5, they are the result of an objective quantitative design process informed by data so that no net loss can be reasonable demonstrated to be achievable.

20.7. Accordingly, my view is that based on the proposal a robust biodiversity offset cannot be developed for long-tailed bats which means no net loss cannot be reasonable demonstrated with any confidence. Therefore, in my opinion the proposal is inconsistent with Policy 11.1 of the WRPS which focusses on working towards achieving no net loss of indigenous biodiversity at a regional scale. The proposal will in my view result in a net loss for long-tailed bats.

21. Assessment of Applicant's Proposed Conditions

21.1. I support the general intent of the conditions proposed by the Applicant to manage adverse effects to vegetation (other than known and potential bat roosts), avifauna and lizards. However, I do not support them in their current form because they rely on management plans to be written after consent might be granted. I consider this approach is not good practice resource management, assumes management can address adverse effects when the Applicant's and the Department's witnesses have stated mitigation outcomes are uncertain and in some cases, experimental.

21.2. The proposed conditions are drawn from those in the s42A report and therefore suffer from the issue I raise in paragraph 20.2 above. The conditions lack detail, specificity, certainty, clearly articulated goals and intended outcomes, appropriate management methods, a full suite of measurable performance targets and adaptive responses if targets are not met.

21.3. Given my recommendations below I do not propose to discuss the conditions on an individual specific basis.

21.4. I have stated my opinion on the Applicant's approach to avoid, remedy, mitigate, offset or compensate adverse effect to long-tailed bats, including whether a mitigation hierarchy has been followed and a robust offset be developed. I am of the opinion that the Applicant has not avoided adverse effects to bats when it should have done so, and

this is consistent with the planning advice I have received from Mr Riddell.

21.5. I do not support the conditions proposed by the Applicant because, notwithstanding that they also suffer from the issues discussed above, adverse effects to long-tailed bats have not been avoided and it is uncertain whether the proposed management measures can achieve their intended outcome, a problem also acknowledged by the Applicant and other witnesses.

22. Recommendations

22.1. I support Mr Riddell's recommendation that the subdivision be redesigned to avoid adverse effects to long-tailed bats. That design in my opinion must include (but not be limited to) the following design features identified in the evidence of Ms Pryde, Dr Kerry Borkin and Mr Kessels to avoid adverse effects on long-tailed bats.

1. A 100 metre buffer on either side of the east-west shelter belt, any roosts or potential roosts and the Southern Gully as well as the Waikato River from the fence on western side to roads, houses or other infrastructure;
2. Ensuring that light levels are reduced to no more than 0.1 lux within buffers, the riparian margin, the east-west shelterbelt and in vegetated gullies, including along roads and paths traversing these features; and
3. The retention of all known and potential roost trees on the site (although this does not preclude replacing those trees with suitable indigenous species planted alongside, once those planted trees have grown to a height that suitable for roosting), linkages between these isolated potential roost trees.

22.2. The recommendation of a 100m buffer recognises Dr Parson's model reported in Crewther and Parson's (2017), which shows in Figure 7 that the probability of Hamilton long-tailed bat presence was highest (0.70) with zero distance to vegetation and fell sharply to less

than 0.1 at a distance of approximately 125 m. This is supported by the modelled influence of gullies on bat presence. In that case the probability of bat presence was highest (0.80) with zero distance to gullies and fell sharply to less than 0.5 at a distance of approximately 100m.

22.3. The modelled results are consistent with other reporting cited in paragraph 96 of Mr Kessels evidence and with his own observations of Hamilton bats which also support a buffer width of 100m.

22.4. Because these recommended features are experimental and their efficacy is not certain, I recommend that a re-designed project be accompanied by conditions for a statistically robust monitoring programme designed to detect and respond to any change in the use of the Amberfield site by long-tailed bats, including movement across the site to the Mangakotukutuku Gully to the west and to Hammond Park and habitats further to the east.

22.5. I support the general intent of conditions proposed to manage adverse effects to vegetation, avifauna and lizards. I recommend that these issues are addressed in a redesign of the subdivision and prior to any issuing of consent. In addition, any management actions must be demonstrably additional to any other management occurring in the absence of the subdivision and be in place for as long as the adverse effect exists, including where possible securing gains with legally binding covenants.

23. Conclusion

23.1. I am comfortable that with appropriate management adverse effects to lizards, avifauna and indigenous vegetation can be addressed. This is not in my opinion the situation for long-tailed bats.

23.2. The ecological work conducted by the Applicant confirms that the Amberfield site is used by long-tailed bats and the adverse effects as more than minor by all witnesses providing evidence on bats.

23.3. The Applicant has not designed the proposed subdivision in a manner that avoids adverse effects to long-tailed bats and has not followed a mitigation hierarchy, but proposes management actions that its own witness, Dr Parsons has stated to be uncertain of outcome. This view is similar to that of Ms Pryde and Dr Borkin.

23.4. An offset is not able to demonstrate no net loss for long-tailed bats because there is insufficient data to support robust offset development, limits to offsets are breached and the proposed management uncertain in its effect.

23.5. In my opinion the proposal should avoid adverse effects to long-tailed bats and to that effect I support Mr Riddell's recommendation that it be redesigned to that effect.

Laurence Peter Barea

23/4/2019