

BEFORE THE HEARING PANEL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of Proposed Plan Change 5 to the Operative Hamilton
City District Plan

**STATEMENT OF EVIDENCE OF JOHN KINROSS MCKENSEY
(LIGHTING)**

Dated 2 September 2022

LACHLAN MULDOWNEY
BARRISTER

P +64 7 834 4336 **M** +64 21 471 490

Office Panama Square, 14 Garden Place, Hamilton

Postal PO Box 9169, Waikato Mail Centre, Hamilton 3240

www.lachlanmuldowney.co.nz

INTRODUCTION

1. My full name is John Kinross Mckensey.
2. I am employed as an Executive Engineer of LDP Ltd (Leading Design Professionals).
3. I hold a Bachelor of Engineering (Electrical) degree from the Queensland Institute of Technology. I have completed the Consulting Engineering Practice and Management programme at the University of Melbourne.
4. I am a member of several relevant associations including:
 - a) Member, Illuminating Engineering Society of Australia and New Zealand (MIES);
 - b) Chartered Member of Engineering New Zealand (CMEngNZ);
 - c) Chartered Member of the Institution of Engineers Australia (MIE Aust);
 - d) Chartered Professional Engineer Australia (CPEng Aust);
 - e) National Engineers Register, Australia (NER);
 - f) APEC Engineer;
 - g) International Professional Engineer, Australia (IntPE);
 - h) Member of the Resource Management Law Association;
 - i) Member of the International Dark Sky Association; and
 - j) New Zealand Green Star Accredited Professional (GSAP).

5. I have over 40 years' experience in lighting design, providing consultancy services for a wide range of clients including local authorities, developers, road controlling authorities and infrastructure sectors. My experience includes:
 - a) Lighting advisor to Auckland Council during the Proposed Auckland Unitary Plan process;
 - b) Lighting advisor to Christchurch City Council during the Replacement District Plan process;
 - c) Author or co-author of five local government codes of practice with respect to exterior lighting, each containing environmental considerations;
 - d) Author of the Auckland Council Sportsfield Lighting Guidelines;
 - e) Lighting advisor to Auckland Transport; and
 - f) Lighting advisor to Waka Kotahi NZ Transport Agency.

6. I also have over 20 years' experience advising as to environmental lighting effects. I have provided consultancy services for private client applicants and local government regarding the assessment of lighting effects for a wide variety of activities and have previous experience in designing lighting to manage effects on the New Zealand long-tailed bat (**LTB**). In particular, I have prepared lighting assessment of effects for exterior lighting installations for the following projects:
 - a) Lighting advice to Hamilton City Council (**HCC**) to inform the Peacocke Structure Plan, which included consideration of the effects of lighting on residents, motorists and the LTB;

- b) Amberfield, Hamilton. Lighting advice to both Weston Lea (as appellant) and HCC (as respondent), under common privilege, regarding environmental lighting effects to inform Resource Consent conditions. This included consideration of the effects of lighting on residents, motorists and the LTB;
 - c) Waikato Expressway Cambridge to Tamahere (for NZTA), which included consideration of the effects of lighting on residents, motorists and the LTB;
 - d) Kennedy Point Marina Waiheke (for the applicant), which included consideration of the effects of lighting on residents, motorists, navigation and biota (Little Penguin);
 - e) Tekapo Drainage Canal (for the applicant), which included consideration of lighting effects on Mt John Observatory;
 - f) Lake Pukaki Development (for the applicant), which was to be located in an intrinsically dark environment;
 - g) Proposed Peacocke Sports Park (for BBO / HCC), including considerations for the LTB; and
 - h) Review of the proposed Broadwater Retirement Village, Peacocke, for HCC, which included consideration of the effects of lighting on residents, motorists and the LTB.
7. I have also reviewed lighting effects for local government in regard to sportsfields, signage and digital billboards, roads, pathways and carparks and private development exterior lighting for buildings, quarry, greenhouse and service stations. I have provided lighting advice to local government for the Devonport Domain, Vauxhall Park, Stanmore Bay League Fields, Waitakere Stadium, Replacement Wynyard Crossing Bridge and Auckland Harbour Bridge Skypath.

8. I have previously prepared and presented evidence in the Environment Court and for Independent Hearings Panels for lighting effects for a number of clients including local government for the following projects of particular relevance to this matter:
 - a) Michaels Avenue Reserve for Auckland Council;
 - b) Waikeria Prison Expansion for Otorohanga District Council;
 - c) Matiatia Marina – Waiheke Island for Auckland Council;
 - d) Kennedy Point Marina – Waiheke Island for Kennedy Point Boat Harbour Ltd;
 - e) Americas Cup AC36 Facilities – Auckland for Panuku Development Auckland (an Auckland Council CCO);
 - f) Auckland Unitary Plan for Auckland Council;
 - g) Christchurch Replacement District Plan for Christchurch City Council;
 - h) Amberfield Development for HCC and the Applicant (common interest privilege);
 - i) Palmerston North Freight Hub for KiwiRail; and
 - j) Waste Management Auckland Regional Landfill for Auckland Council.
9. I provided a report (**Original Report**), assessing lighting matters arising under the proposed Plan Change 5 to the Operative Hamilton District Plan (**PC5**), dated 7 July 2021, which is Appendix Q to the Assessment of Environmental Effects.
10. I have provided a further report (**Supplementary Report**), assessing lighting matters and dated 31 August 2022, following my review of

submissions made in relation to PC5. The Supplementary Report is appended to my evidence as **Attachment 1**.

11. I attended expert conferencing on the Bats and Planning topic convened on 24 August 2022 and signed the Joint Witness Statement dated 24 August 2022.

CODE OF CONDUCT

12. I have read the Environment Court Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2014 and agree to comply with it. I confirm that the opinions expressed in this statement are within my area of expertise except where I state that I have relied on the evidence of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

SCOPE OF EVIDENCE

13. I provide this evidence on behalf of HCC as proponent of PC5. It includes a summary of the findings in my technical reports, respond to matters raised in submissions and comment on the updated PC5 provisions.

EXECUTIVE SUMMARY

14. HCC engaged LDP Ltd to assist in assessing environmental lighting effects arising under PC5 and developing plan provisions to address lighting effects on the New Zealand long-tailed bat (**LTB**).
15. The degree or nature of light aversion or attraction attributable to the LTB is presently unknown, but it is generally accepted that the LTB is light sensitive and as such, in my opinion, it is appropriate to minimise obtrusive light effects.

16. In the absence of any suitable New Zealand guidelines specifically addressing the LTB, my recommended rules are based upon the United Kingdom (**UK**) Guidelines¹ as one of the only two internationally recognised documents that address lighting effects to bats, to my current knowledge. The rules were also informed by the recent Environment Court decision for the Amberfield development in Peacocke.
17. The key lighting control within the PC5 provisions, as notified, was Rule 25.6.4.4 a) which stated:

Lighting shall not exceed 0.3 lux (horizontal and vertical) when measured at the external boundary of the Significant Bat Habitat Area.

18. While such a control on (artificial) outdoor lighting is critical, I do not consider that it alone represents a complete suite of protections for the LTB. In my opinion, the lighting provisions in PC5, as notified, require some updating to achieve an appropriate level of protection to the LTB.
19. Set out at paragraph 47 are a series of recommended amendments to the plan provisions which, if adopted by the panel, will achieve the level of protection required.
20. These amendments appropriately address all relevant submissions addressing the issue of lighting controls within the Peacocke Structure Plan area.

TECHNICAL REPORTS

21. HCC engaged LDP Ltd to assist in assessing environmental lighting effects arising under PC5 and guidelines for PC5 to address lighting effects to the LTB.

¹ Guidance Note 08/18: Bats and artificial lighting in the UK – the Bat Conservation Trust & the Institution of Lighting Professionals

22. Based on my research – confirmed by discussion with ecologist colleagues Ms Mueller, Mr Kessels and Mr Baber – the degree or nature of light aversion or attraction attributable to the LTB is presently unknown, but it is generally accepted that the LTB is light sensitive and as such, in my opinion, it is appropriate to minimise obtrusive light effects.
23. In my Original Report I developed a set of proposed lighting rules that I recommended be included in PC5. In the absence of any suitable New Zealand guidelines specifically addressing the LTB, I based the proposed rules upon the United Kingdom (**UK**) Guidelines² as one of the only two internationally recognised documents that address lighting effects to bats, to my current knowledge. The rules were also informed by the recent Environment Court decision for the Amberfield development in Peacocke.
24. The Original Report proposed the following rules:
 - a) Added illuminance must be no greater than 0.3 lux in the vertical plane at 1m above ground at the bat habitat boundary;
 - b) Luminaires using warm white LED, emitting zero direct upward light. Luminaires must be installed with the light emitting surface facing directly down and be mounted as low as practical;
 - c) A maximum of 3000K colour temperature, for land with a residential use and 2700K for all other uses (e.g. all roads, access ways, commercial lots, reserves, etc);
 - d) Exterior security lighting controlled by a motion sensor with a short duration timer (1 minute);

² Guidance Note 08/18: Bats and artificial lighting in the UK – the Bat Conservation Trust & the Institution of Lighting Professionals

- e) Artificial exterior lighting within a bat habitat (may be installed) for the express use of providing emergency lighting for an essential public service that could require unavoidable maintenance at night – e.g. a wastewater pumping station. The lighting must be white LED with a maximum 2700K colour temperature, installed with the light emitting surface facing directly down, emit zero direct upward light and be mounted as low as practical;
 - f) Exterior lighting (should not be installed) for a multi-storey building, on an elevated balcony, elevated open walkway, stairwell or other building feature with external openings positioned on a building face adjacent to a bat habitat; and
 - g) Artificial exterior lighting (should not be installed) within a bat habitat, other than emergency lighting for an essential public service.
25. The Original Report also recommended inclusion of the following guidance notes:
- a) To assist in minimising potential adverse lighting effects to the New Zealand long-tailed bat, the following publication provides further guidance that may prove helpful:

Guidance Note 08/18: Bats and artificial lighting in the UK
[\(https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/\)](https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/)
 - b) In addition, the following notes may be helpful:
 - i. The UK document recommends no more than 2700K adjacent bat habitat, so that is the preferred upper limit. The permitted activity rules for residential use require a maximum of 3000K as that is typically the lowest available for residential grade

lights. If 2700K or lower can be obtained, it would be preferable.

- ii. The use of a maximum of 3000K with zero direct upward light is encouraged for locations beyond those adjoining the bat habitat as bats in flight will see a vista greater than just the immediate area.
- iii. Limiting the height of luminaires can be helpful. The New Zealand long-tailed bat has a tendency to fly near the top of trees and the upper outer tree canopy edges. Hence, any lighting more than a few metres high may become directly visible to the bat in flight.
- iv. Bats tend to fly near tree tops and near the outer edges of foliage canopies. Where a multi-storey building is proposed adjacent to a bat habitat, features such as an elevated open walkway or open stairwell requiring exterior lighting should be placed on a face of the building other than the building face adjacent to the bat protected area. Since some such features may require lighting, where this is the case they should be located in a part of the building which does not face the bat habitat.
- v. In the case of a building lot immediately adjacent a bat habitat, a minimum building setback of 5m with a solid 1.5m high boundary fence (i.e. impervious to light passing through), together with sensible lighting design, is capable of achieving compliance.

26. PC5 was then developed by HCC and notified. PC5 as notified introduced one rule related to bats in Chapter 25.6 Lighting and Glare, at Rule 25.6.6.6 a):

Lighting shall not exceed 0.3 lux (horizontal and vertical) when measured at the external boundary of the Significant Bat Habitat Area.

27. While this core lighting management control was proposed, PC5 as notified did not address the other rules suggested in paragraph 19 above, nor the guidance notes suggested in paragraph 20.
28. After reviewing the submissions made on PC5 and attending expert caucusing, I have altered my view on some of the rules proposed in the Original Report. However, it remains my recommendation that some of the Original Report rules, with amendments, be included in PC5.
29. Upon further consideration, I no longer support the inclusion of the guidance notes that were proposed in the Original Report.
30. The amendments and rationale are detailed in the Supplementary Report.
31. My current recommendations are summarised at paragraph 47 below.

RESPONSE TO SUBMISSIONS

32. I set out below my overall response to substantive lighting technical matters raised in submissions. My detailed comments are noted in Appendix B to the Supplementary Report. The Supplementary Report also includes comments in relation to planning or ecology submissions, in order to clarify lighting technical aspects only.

Fixed vs moving lighting

33. Submitters³ noted that the lighting rules at Chapter 25.6.4.4 should relate to fixed lighting (i.e. not moving lights such as vehicle headlights). I agree and note that it is impractical to regulate and measure moving light effects. In addition, fixed lighting has a much greater potential for nuisance than the intermittent presence of moving lights such as vehicle headlights. I have proposed amendments to Rule 25.6.4.4 to address this issue.

Vehicle headlight sweep

34. Submitters⁴ suggested that “Bat Priority Areas” (**BPA**) or “high-value bat habitats”, to use their wording, should be protected from headlight sweep through provision of vegetation screening.
35. I disagree. It is impractical to capture all such effects due to the organic nature of vegetation (i.e. there will always be gaps) and the considerable variance in potential headlight beam angles with vehicle position and other variables (e.g. road slope, relative road vs BPA height, road camber, speed humps, crossovers, vehicle loading, acceleration, cornering, headlight adjustment – including automatic adjustments in some vehicles, etc).
36. The technology does not exist to monitor absolutely every point in space at the BPA boundary, continuously, to endeavour to detect the illuminance (lux) generated by vehicle headlights. Hence, it would be impractical to enforce.
37. In addition, during the Amberfield Environment Court hearing the applicant’s ecologists, under the direction of Dr Stuart Parsons, undertook

³ Broadwater Village Limited – submitter 23; B and R Inger – submitter 46; The Adare Company – submitter 53.

⁴ A Graves – submitter 30; Director-General of Conservation – submitter 38.

an analysis of historical LTB behaviour near road lighting and concluded that “Bats persist in the presence of vehicle headlights”.

38. Hence, in my opinion, it is neither practical nor necessary to regulate or screen vehicle headlight effects in relation to the LTB.

LTB lighting rules and guidance

39. Submitters⁵ have suggested that the lighting provisions in PC5 as notified, specifically Rule 25.6.4.4, are insufficient to provide adequate protection for the LTB and some request that they be adjusted to align with the Resource Consent conditions applied to the Amberfield development by the Environment Court.

40. I refer to my comments in Appendix B of my Supplementary Report which sets out my response to these submissions. To the extent that I agree with the submission points, I propose amendments to Rule 25.6.4.4 and the insertion of advisory notes as set out at paragraph 47 below.

High rise buildings

41. Submitters⁶ have suggested that the height of buildings adjacent the BPA and/or lighting installed in those buildings should be limited.

42. I agree in principle that this would be desirable. The UK guidelines⁷ do make recommendations in terms of limiting such lighting (but not building height). The EUROBATs Guidelines⁸ do not make any specific mention of lighting in high rise buildings.

⁵ G McMillan – submitter 16; Go Eco (Waikato Environmental Centre) – submitter 20; A Graves – submitter 30; Waikato Regional Council – submitter 36; Director-General of Conservation – submitter 38; Harvey Aughton – Go Eco – submitter 58.

⁶ G McMillan – submitter 16; A Graves – submitter 30.

⁷ Guidance Note 08/18: Bats and artificial lighting in the UK – the Bat Conservation Trust & the Institution of Lighting Professionals

⁸ EUROBATs Publication Series no. 8 – Guidelines for consideration of bats in lighting projects

43. The lighting rules proposed at paragraph 47 will apply at any height. Thereby, in my opinion, they will be sufficient to capture high rise building effects.

Public amenity and safety

44. Kainga Ora has proposed adjustments to Section 25.6.2 (City Wide – Lighting and Glare – Objectives and Policies) to ensure that public safety is adequately addressed while ensuring an appropriate degree of protection for the LTB.
45. I agree with its proposed amendments which are set out in full in Section 5.1 of my Supplementary Report and recommend that they be adopted (Submission 55 – sub-point number 55.389).

UPDATED PC5 PROVISIONS

46. I agree with the updated PC5 provisions in relation to lighting. In addition to the amendments that I support in paragraph 45 above, I recommend the amendments set out below for reasons stated in the Original and Supplementary Lighting Reports and my Evidence.
47. I recommend that Rule 25.6.4.4 a) be replaced and extended as follows:
- a) Added illuminance from artificial outdoor lighting shall not exceed 0.3 lux (horizontal and vertical) at any height at the external boundary of the Significant Bat Habitat Area (SBHA).
 - b) Artificial outdoor lighting shall be fixed artificial outdoor lighting. Lighting attached to a vehicle is not considered to be fixed.
 - c) Artificial outdoor lighting on land adjoining a SBHA, including land immediately on the opposite side of a road which adjoins a SBHA, must;
 - i) Emit zero direct upward light.

ii) Be installed with the light emitting surface facing directly down and be mounted as low as practical.

iii) Be white LED with a maximum colour temperature of:

- 3000K on land with a residential use where separated from a SBHA by a public road with maximum 2700K lighting
- 2700K for land with a residential use directly abutting a SBHA
- 2700K for all other uses.

iv) In the case of exterior security lighting, be controlled by a motion sensor with a short duration timer (5 minutes).

d) Artificial outdoor lighting within a SBHA is only permitted for the express use of providing emergency lighting for an essential public service that could require unavoidable maintenance at night – e.g. a waste water pumping station. The lighting must be white LED with a maximum 2700K colour temperature, installed with the light emitting surface facing directly down, emit zero direct upward light and be mounted as low as practical.

Advisory Notes:

1. The term 'Added Illuminance' means illuminance added by artificial outdoor lighting that is therefore additional to illuminance present from natural ambient lighting. The Ambient Illuminance should be measured at a nearby proxy location on the same night and for the same sky conditions (clouds, weather, etc). The proxy location must have an unobstructed view of the sky, sufficient to ensure that the measurement is not affected. The Added Illuminance may then be determined by subtracting the Ambient Illuminance from the Measured Illuminance.
2. Any illuminance meter must be recently calibrated by a suitably accredited laboratory. The calibration should consider the spectral response and the meter must accurately read to 0.1 lux.

John Kinross Mckensey

2 September 2022

ATTACHMENT 1

PLAN CHANGE 5 – PEACOCKE STRUCTURE PLAN SUPPLEMENTARY TECHNICAL REPORT

LIGHTING

Prepared for

HAMILTON CITY COUNCIL

INDEPENDENT ELECTRICAL & ILLUMINATION ENGINEERS

LDP Limited

L4 B:HIVE, Smales Farm T: +64 9 414 1004

74 Taharoto Rd E: info@ldp.nz




Auckland 0622 New Zealand W: www.ldp.nz



DOCUMENT VERSION HISTORY

| Revision | Prepared By | Description | Date |
|----------|---------------|-------------------------------|------------|
| 1 | John Mckensey | Draft issue for client review | 29/08/2022 |
| 2 | John Mckensey | Final | 31/08/2022 |
| | | | |
| | | | |
| | | | |

DOCUMENT QUALITY ASSURANCE

| Action | Name | Signed | Date |
|--------------|----------------------------------|--|------------|
| Prepared by | John Mckensey |  | 31/08/2022 |
| Reviewed by | Laurie Cook |  | 31/08/2022 |
| Approved by | John Mckensey |  | 31/08/2022 |
| on behalf of | Dean Coleman – Managing Director | | |

CONTENTS

| | |
|--|----|
| DOCUMENT VERSION HISTORY..... | 2 |
| DOCUMENT QUALITY ASSURANCE..... | 2 |
| CONTENTS | 3 |
| APPENDICES | 3 |
| EXECUTIVE SUMMARY | 4 |
| 1.0 INTRODUCTION | 5 |
| 2.0 ORIGINAL REPORT..... | 5 |
| 3.0 SUBMISSIONS – LIGHTING..... | 8 |
| 4.0 CONFERENCING | 9 |
| 4.1 Extent of lighting protection for the LTB | 10 |
| 4.2 Flicker effects..... | 10 |
| 4.3 Illuminance meter calibration | 10 |
| 5.0 FURTHER RECOMMENDATIONS..... | 11 |
| 5.1 District Plan Chapter 25.6.2 Objectives and Policies: Lighting and Glare | 11 |
| 5.2 District Plan Chapter 25.6.4.4 Peacocke Medium Density Zone: Peacocke Precinct | 12 |

APPENDICES

- A: LDP original Technical Report – Lighting
- B: LDP comments regarding submissions – Lighting

EXECUTIVE SUMMARY

Based on further review following public submissions being received, we have updated our previous recommendations, added support for certain changes proposed by submitters and recommend adjustments to PC5 in relation to lighting.

The proposed amendments are included at Section 5.

1.0 INTRODUCTION

Hamilton City Council (**HCC**) engaged LDP Ltd in April 2021 to provide lighting advice intended to inform wording in Proposed Plan Change 5 (**PC5**) – Peacocke Structure Plan. This culminated in a Technical Report – Lighting (**Original Report**), prepared by LDP and dated 7 July 2021 – copy enclosed at Appendix A.

Subsequently, we were asked to review submissions made with respect to lighting matters. We reported our opinion and recommendations in a spreadsheet – copy enclosed at Appendix B.

Thereafter, we liaised with HCC, their consultant planning & ecology teams and we have participated in submitter engagement meetings and attended expert witness conferencing on the topic ‘Bats and Planning’.

This report summarises the activities that have occurred to date and provides recommendations for adjustments to PC5 as notified in relation to lighting.

2.0 ORIGINAL REPORT

In conjunction with our report, 4Sight Consulting prepared a long-tailed bat (**LTB**) report (**4Sight Report**). Since lighting effects on bats are a cross-discipline topic, we liaised with 4Sight and agreed that there should be lighting controls within PC5 to provide protection for the LTB.

We agreed that provisions should be informed by the recent Environment Court decision that informed the conditions of consent for the Amberfield development (contained within Peacocke Structure Plan Area).

In addition, in the absence of New Zealand specific guidelines regarding bats in general and specifically the LTB, we agreed that the document, produced as a joint publication by the Bat Conservation Trust & the Institution of Lighting Engineers, titled “Guidance Note 08/18: Bats and artificial lighting in the UK” (**UK Bat Guidelines**), would be helpful as a reference.

Subsequent to producing our report in 2021, a number of resource consent matters have arisen at Council and Environment Court level, wherein it has now become a default to instead refer to an alternative document, being EUROBATS Publication Series No. 8, titled "Guidelines for consideration of bats in lighting projects" (**EUROBAT Guidelines**). Both documents were produced in 2018 and have very similar recommendations.

In summary, the Original Report made the following principal recommendations;

1. *Added illuminance must be no greater than 0.3 lux in the vertical plane at 1m above ground at the bat habitat boundary*
2. *Luminaires using warm white LED, emitting zero direct upward light. Luminaires must be installed with the light emitting surface facing directly down and be mounted as low as practical*
3. *A maximum of 3000K colour temperature, for land with a residential use and 2700K for all other uses (e.g. all roads, access ways, commercial lots, reserves, etc)*
4. *Exterior security lighting controlled by a motion sensor with a short duration timer (1 minute)*
5. *Artificial exterior lighting within a bat habitat (may be installed) for the express use of providing emergency lighting for an essential public service that could require unavoidable maintenance at night – e.g. a waste water pumping station. The lighting must be white LED with a maximum 2700K colour temperature, installed with the light emitting surface facing directly down, emit zero direct upward light and be mounted as low as practical*
6. *Exterior lighting (should not be installed) for a multi-storey building, on an elevated balcony, elevated open walkway, stairwell or other building feature with external openings positioned on a building face adjacent to a bat habitat*
7. *Artificial exterior lighting (should not be installed) within a bat habitat, other than emergency lighting for an essential public service*

Since the Original Report was prepared, our view has altered in certain respects as summarised below.

- Item 1: Change to also include horizontal light and at any height
- Item 2: No change
- Item 3: Adjust to align with the Amberfield Environment Court Decision
- Item 4: Change timer duration to 5 minutes as 1 minute is considered too short for practical use
- Item 5: No change
- Item 6: Delete. Considered neither practical nor necessary (Refer to further comments made against submission sub-point 16.3 in Appendix B).
- Item 7: Delete. Redundant as already addressed at item 5

In addition, the Original Report recommended inclusion of the following Advisory Notes in Chapter 25.6;

PSPA BAT SENSITIVE LIGHTING – GUIDANCE NOTES

To assist in minimising potential adverse lighting effects to the New Zealand long-tailed bat, the following publication provides further guidance that may prove helpful;

- *Guidance Note 08/18: Bats and artificial lighting in the UK*
(<https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>)

In addition the following notes may be helpful;

1. *The UK document recommends no more than 2700K adjacent bat habitat, so that is the preferred upper limit. The permitted activity rules for residential use require a maximum of 3000K as that is typically the lowest available for residential grade lights. If 2700K or lower can be obtained, it would be preferable.*

2. *The use of a maximum of 3000K with zero direct upward light is encouraged for locations beyond those adjoining the bat habitat as bats in flight will see a vista greater than just the immediate area.*
3. *Limiting the height of luminaires can be helpful. The New Zealand long-tailed bat has a tendency to fly near the top of trees and the upper outer tree canopy edges. Hence, any lighting more than a few metres high may become directly visible to the bat in flight.*
4. *Bats tend to fly near tree tops and near the outer edges of foliage canopies. Where a multi-storey building is proposed adjacent to a bat habitat, features such as an elevated open walkway or open stairwell requiring exterior lighting should be placed on a face of the building other than the building face adjacent to the bat protected area. Since some such features may require lighting, where this is the case they should be located in a part of the building which does not face the bat habitat.*
5. *In the case of a building lot immediately adjacent a bat habitat, a minimum building setback of 5m with a solid 1.5m high boundary fence (i.e. impervious to light passing through), together with sensible lighting design, is capable of achieving compliance.*

My current recommendation for the Advisory Notes is included at Section 5.

3.0 SUBMISSIONS – LIGHTING

We have assessed each of the submissions addressing lighting matters and responded with our opinion and recommended action – as enclosed at Appendix B.

Various submissions highlighted potential shortcomings regarding lighting, with which we generally agree, and as stated in this report, we recommend modifications to PC5 as notified to address these matters.

In particular, we refer to the following submission points;

| SUBMITTER | SUB-POINT | TOPIC SUMMARY |
|----------------------------------|---------------------------|---|
| Broadwater Village Ltd | 23.16 | Significant Bat Habitat Area (SBHA) light spill |
| Andrea Graves | 30.4, 30.13, 30.20 | Lighting controls re the NZ long-tailed bat (LTB) |
| Director General of Conservation | 38.60, 38.65, 38.66 | Lighting controls re the LTB |
| Ben & Rachel Inger | 46.6 | SBHA light spill |
| The Adare Company | 53.82 | Lighting controls re the LTB |
| Kainga Ora | 55.389 | Lighting effects to the LTB, with regard for public amenity |

In our opinion, the remaining points raised by submitters would require no change to the notified PC5 provisions. They are each addressed in our comments at Appendix B.

Appendix B provides our analysis of the points raised and the rationale for our recommendations. Our proposed amendments are shown in *green italics*.

4.0 CONFERENCING

Expert conferencing was held in relation to LTB on 24 August 2022 and the outcomes of conferencing are addressed in the Joint Witness Statement. In terms of the lighting issues, I make the following additional points:

4.1 Extent of lighting protection for the LTB

Based on the conditions proposed in this report, the entire Peacocke area will be subject to limits relating to upward light and colour temperature.

The SBHA areas will additionally include boundary spill light limits.

The SBHA boundary limits will ensure that there will be effectively no direct *artificial outdoor lighting* effects that reach the SNA areas.

4.2 Flicker effects

A learned paper produced by Inger¹ indicates that Biota, including Bats, can be affected by flicker effects from lighting. Modern LED lighting operates at much higher frequency than older technologies such as incandescent, HID or older fluorescent sources and as such, flicker effects tend to be less visually evident. Nonetheless, there does remain a question as to whether or not, flicker from an LED light source is a significant issue for Bats.

We note that the street lighting throughout Hamilton has already been converted to LED and LED has become the light source of choice for nearly all applications now for outdoor and indoor lighting.

Inger's paper was published in 2014. In the intervening 8 years, significant advancements have been made in LED technology and LED drivers currently in use operate at frequencies of 50kHz or higher. The Inger paper appears to note effects when flicker occurs at frequencies of 200Hz or less. Hence, the much higher operating frequency of modern LED drivers would appear not to be of particular concern.

Regardless, in the case of Peacocke, the lighting limits proposed will limit obtrusive *artificial outdoor lighting* such that there will be no lights within the SBHA or SNA. There will be no direct *artificial outdoor lighting* reaching the SNA, nor reaching past a few metres into the SBHA from the boundary and even then only a fraction of 1 lux. Hence, in our opinion, the LTB in SNA and SBHA areas will not be subject to any direct *artificial outdoor lighting* effects, flicker or otherwise.

In our opinion, the measures currently proposed will be sufficient to ensure that flicker effects will be negligible to nil.

4.3 Illuminance meter calibration

The principal tool for control of *artificial outdoor lighting* effects will be the bat sensitive lighting design required by the proposed rules, to be submitted as part of the Resource Consent process for each site.

¹ Potential biological and ecological effects of flickering artificial light – Richard Inger et al, May 2014

However, the conditions for such Consents should direct that any illuminance meter be appropriate for the task of proving compliance. It would also apply if any future concerns are raised and enforcement checks are proposed.

In particular, the meter should be calibrated and accurately read to 0.1 lux. We recommend an advisory note be included to address this aspect.

That calibration should be undertaken by an accredited laboratory and should address the spectral response.

5.0 FURTHER RECOMMENDATIONS

Summarising the recommendations made above and in Appendix B, we recommend the following changes to the MDRS Version (Insertions are shown in red underline and deletions in red strikethrough):

5.1 District Plan Chapter 25.6.2 Objectives and Policies: Lighting and Glare

We recommend changing the wording as proposed by Kainga Ora at submission sub-point 55.389. Refer Appendix B for further details.

The revisions proposed are as follows;

25.6.2.2a Manage light spill and glare of fixed lighting at the boundary of the Significant Bat Habitat Area to ensure that the useability of long-tailed bat habitat is maintained while maintaining safety on adjoining properties.

25.6.2.2b Ensure that fixed lighting in public spaces, such as parks and road corridors is designed to minimise the effects of lighting and glare on Significant Bat Habitat Area while also achieving a safe public realm for the community.

Also, add the following Explanation;

The Peacocke Precinct is an important habitat for long-tail bats which are a threatened native species. Due to the presence of bats in the area, it is important the effects of development are managed to ensure bats are able to continue to move and forage through the

area. *This needs to be balanced against the safety needs of the community.* Bats are particularly sensitive to light, which has the potential to inhibit their movement and feeding habits. For this reason, it is important that those areas of Peacocke identified as being Significant Bat Habitat Areas are protected from the effects of *excessive* lighting and glare.

5.2 District Plan Chapter 25.6.4.4 Peacocke Medium Density Zone: Peacocke Precinct

We recommend changes as noted and further explained in Appendix B against sub-point 23.16, in relation to the fixed nature of lighting. The submitter proposed addressing this at section 25.6.3, but that is city-wide rather than Peacocke-specific. Hence, I propose that this be addressed at section 25.6.4.4 instead – refer item 'b)' below.

A number of submitters have indicated concern that this has not been clarified and we agree that it should be clarified for avoidance of doubt.

We also recommend changes to rule 25.6.4.4 a) as noted below and further explained in Appendix B against sub-point 30.4.

The wording in the Notified Version is;

a) Lighting shall not exceed 0.3 lux (horizontal and vertical) when measured at the external boundary of the Significant Bat Habitat Area.

We have also clarified the recommended locations for 2700K versus 3000K colour temperature lighting to align with the Amberfield interim EC decision.

While it is understood that overseas recommended practice is to use 2700K or less throughout, it was raised during the Amberfield hearing that this requirement is particularly onerous for residential land as it would entail using considerably more expensive and difficult to source commercial grade rather than residential grade luminaires.

In addition, we believe that the principal driver for 2700K is to minimise the blue light content as it is considered likely to be particularly obtrusive. However, while there is a significant reduction in blue light between 5000K and 4000K, a modest amount between 4000K and 3000K, there is only a minor improvement between 3000K and 2700K.

In the case of Amberfield, the EC accepted that residential use separated by a road (lit to 2700K) from the BPA (i.e. SBHA) could use 3000K

luminaires. For the same reasons and for consistency with the EC decision, we recommend adopting this approach throughout Peacocks.

The proposed revised wording to replace what is in the Notified Version wording above is as follows;

- a) Added illuminance from artificial outdoor lighting shall not exceed 0.3 lux (horizontal and vertical) at any height at the external boundary of the Significant Bat Habitat Area (SBHA).
- b) Artificial outdoor lighting shall be fixed artificial outdoor lighting. Lighting attached to a vehicle is not considered to be fixed.
- c) Artificial outdoor lighting on land adjoining a SBHA, including land immediately on the opposite side of a road which adjoins a SBHA, must:
 - i) Emit zero direct upward light.
 - ii) Be installed with the light emitting surface facing directly down and be mounted as low as practical.
 - iii) Be white LED with a maximum colour temperature of;
 - 3000K on land with a residential use where separated from a SBHA by a public road with maximum 2700K lighting
 - 2700K for land with a residential use directly abutting a SBHA
 - 2700K for all other uses
 - iv) In the case of exterior security lighting, be controlled by a motion sensor with a short duration timer (5 minutes).
- d) Artificial outdoor lighting within a SBHA is only permitted for the express use of providing emergency lighting for an essential public service that could require unavoidable maintenance at night – e.g. a waste water pumping station. The lighting must be white LED with a maximum 2700K colour temperature, installed with the light emitting surface facing directly down, emit zero direct upward light and be mounted as low as practical.

In addition, we recommend inclusion of the following advisory notes. In our opinion, best practice in terms of lighting for bats may not be common knowledge, including among lighting specialists. Hence, in order to prepare or review, either a bat sensitive lighting design or management plan, additional guidance would be helpful.

We have considered the notes mooted in our original report, removed some repetitive elements and items no longer considered essential and also added one item mentioned earlier regarding meter calibration.

Advisory Notes:

1. The term 'Added Illuminance' means illuminance added by artificial outdoor lighting that is therefore additional to illuminance present from natural ambient lighting. The Ambient Illuminance should be measured at a nearby proxy location on the same night and for the same sky conditions (clouds, weather, etc). The proxy location must have an unobstructed view of the sky, sufficient to ensure that the measurement is not affected. The Added Illuminance may then be determined by subtracting the Ambient Illuminance from the Measured Illuminance.
2. Any illuminance meter must be recently calibrated by a suitably accredited laboratory. The calibration should consider the spectral response and the meter must accurately read to 0.1 lux.

APPENDIX A

LDP original Technical Report – Lighting

Project: PEACOCKE STRUCTURE PLAN AREA CHANGE

LDP Ref: 21-0018-001A

Subject: BAT SENSITIVE LIGHTING RULES

Organisation HAMILTON CITY COUNCIL

Attention: Jamie Sirl

Date: 07/07/2021

Email: Jamie.Sirl@hcc.govt.nz

From: John Mckensey

Signed: 

This technical memo has been prepared at the request of Hamilton City Council (**HCC**), in conjunction with a long-tailed bat report (**4Sight Report**) prepared by 4Sight Consulting (**4Sight**), to inform bat sensitive lighting rules for a proposed plan change to the Peacocke Structure Plan Area (**PSPA**).

1.0 INTRODUCTION

The PSPA is known to contain habitat used by the national critically endangered New Zealand long-tailed bat (**LTB**). While there is a lack of literature available regarding lighting effects on the LTB, 4Sight are of the opinion that a conservative approach is warranted and that the LTB should be assumed to be light sensitive.

Hence, HCC consider it would be appropriate to establish a set of bat sensitive lighting rules for the PSPA.

2.0 PROPOSED METHODOLOGY

In the absence of useful research regarding lighting effects for the LTB, we have agreed with 4Sight that the most appropriate guide currently available would be the publication jointly produced in 2018 by the (UK based) Bat Conservation Trust (**BCT**) and the (UK based) Institution of Lighting Professionals (**ILP**) – "Guidance Note 08/18: Bats and artificial lighting in the UK" (**GN 08/18**).

INDEPENDENT ELECTRICAL & ILLUMINATION ENGINEERS

This document and any attachments hereto contain confidential and/or privileged information. This information is intended solely for the individual or entity named above. If the reader of this document is not the intended recipient, you are hereby notified that any use, disclosure, storage, dissemination, or duplication of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately at the address above or by return fax, and destroy this document.

GN 08/18 recommends various physical mitigation measures in relation to separation and screening. Matters such as these have been addressed in the 4Sight Report.

In terms of lighting, GN 08/18 recommends consideration of the following potential measures to mitigate effects;

- Avoid lighting key habitats
- Set acceptable lux limits with ecologist guidance
 - Complete darkness could be considered as 0.2 lux horizontal or 0.4 lux vertical
NOTE: In our opinion, a practical interpretation would be "a limit of 0.3 lux in the vertical plane at 1m above ground"
 - Relevant luminaire features;
 - Use warm white LED luminaires, aimed down and emit zero direct upward light
 - Use a warm colour temperature – preferably no more than 2700K
 - The LED spectral peak should be higher than 550nm and lack UV
NOTE: White LED sources do not emit any significant amount of UV. Also, LED sources with a colour temperature of 3000K or less invariably have a spectral peak higher than 550nm. Therefore, a warm white LED with a colour temperature no higher than 3000K will usually automatically address both the UV and spectral peak recommendations
 - Minimise luminaire mounting height to minimise visibility and light spill
 - External security lighting on motion sensors with a short duration (1 minute)
 - Consider the type and location of interior lighting to minimise spill light and glare, where adjacent glazing faces directly toward bat habitat – refer to GN 08/18 for further guidance
 - Consider dimming or part night switching

NOTE: Provided the lux limit and luminaire features described above are achieved, there would be no additional benefit in these measures and they could potentially give rise to unwanted effects such as increased crime. Hence, while such measures may be considered if believed to provide sufficient net benefit, we do not recommend mandating such measures. Further guidance is given in GN 08/18.

- Demonstrate compliance with lux limits

The BCT website advises that they are looking to update GN 08/18 and anticipated doing so by the end of 2020. However, that does not appear to have occurred as yet, so GN 08/18 is currently considered best practice.

In addition, as discovered during the recent Amberfield (Weston Lea) Environment Court hearing, while 2700K luminaires are obtainable for commercial luminaires (e.g. roadway lights), residential outdoor luminaires are invariably available with a minimum of 3000K colour temperature. We believe that the rationale for 2700K emanates from a desire to minimise the 'blue' content and there are only a few percentage points difference in that regard between 2700K and 3000K. Therefore, we propose that the 'permitted activity' for residential lots mandate 3000K, but include a preference for 2700K in the Guidance notes.

The foregoing measures are given as a range of possible measures to consider. They are not necessarily all required. We are of the opinion that it would be practical to achieve sufficient control with a limited portion of these measures set as compliance standards. An additional set of guidance notes could be provided to assist in achieving best practice outcomes.

3.0 RECOMMENDED RULES

Based on the foregoing, we recommend the following rules;

PSPA BAT SENSITIVE LIGHTING – STANDARDS

The Peacocke Structure Plan Area contains habitat used by the New Zealand long-tailed bat which is a national critically endangered species and believed to be light sensitive. The following standards and guidance notes are intended to minimise potential loss of habitat.

Where the term "land adjoining" is used, it includes all land uses, including but not limited to, building lots, public roads, private roads, access ways and reserves.

The terms "artificial outdoor lighting" and "fixed lighting source" include all static lighting fixed to a permanent structure (e.g. building, lighting column, fence). They exclude mobile vehicle or mobile machinery mounted lighting (e.g. headlights, navigation lights, hazard warning lights, working lights).

Permitted Activities

Artificial outdoor lighting on land adjoining bat habitat, which satisfies the following requirements, will be a Permitted Activity;

- 1. Added illuminance must be no greater than 0.3 lux in the vertical plane at 1m above ground at the bat habitat boundary.*
- 2. Luminaires using warm white LED, emitting zero direct upward light. Luminaires must be installed with the light emitting surface facing directly down and be mounted as low as practical.*
- 3. A maximum of 3000K colour temperature, for land with a residential use and 2700K for all other uses (e.g. all roads, access ways, commercial lots, reserves, etc), and*
- 4. Exterior security lighting controlled by a motion sensor with a short duration timer (1 minute)*

Restricted Discretionary Activities

The following are restricted discretionary activities;

- 1. Artificial exterior lighting within a bat habitat for the express use of providing emergency lighting for an essential public service that could require unavoidable maintenance at night – e.g. a waste water pumping station. The lighting must be white LED with a maximum 2700K colour temperature, installed with the light emitting surface facing directly down, emit zero direct upward light and be mounted as low as practical.*

Non-complying Activities

The following are non-complying activities;

- 1. Exterior lighting for a multi-storey building, on an elevated balcony, elevated open walkway, stairwell or other building feature with external openings positioned on a building face adjacent to a bat habitat*

Prohibited Activities

The following are prohibited activities;

- 1. Artificial exterior lighting within a bat habitat, other than emergency lighting for an essential public service, and*
- 2. Any lighting adjoining bat habitat that does not satisfy the Permitted Activity requirements.*

4.0 RECOMMENDED GUIDANCE NOTES

In addition to the above rules, we recommend the following guidance notes;

PSPA BAT SENSITIVE LIGHTING – GUIDANCE NOTES

To assist in minimising potential adverse lighting effects to the New Zealand long-tailed bat, the following publication provides further guidance that may prove helpful;

- Guidance Note 08/18: Bats and artificial lighting in the UK*
(<https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>)

In addition the following notes may be helpful;

- 1. The UK document recommends no more than 2700K adjacent bat habitat, so that is the preferred upper limit. The permitted activity rules for residential use require a maximum of 3000K as that is typically the lowest available for residential grade lights. If 2700K or lower can be obtained, it would be preferable.*
- 2. The use of a maximum of 3000K with zero direct upward light is encouraged for locations beyond those adjoining the bat habitat as bats in flight will see a vista greater than just the immediate area.*

3. *Limiting the height of luminaires can be helpful. The New Zealand long-tailed bat has a tendency to fly near the top of trees and the upper outer tree canopy edges. Hence, any lighting more than a few metres high may become directly visible to the bat in flight.*
4. *Bats tend to fly near tree tops and near the outer edges of foliage canopies. Where a multi-storey building is proposed adjacent to a bat habitat, features such as an elevated open walkway or open stairwell requiring exterior lighting should be placed on a face of the building other than the building face adjacent to the bat protected area. Since some such features may require lighting, where this is the case they should be located in a part of the building which does not face the bat habitat.*
5. *In the case of a building lot immediately adjacent a bat habitat, a minimum building setback of 5m with a solid 1.5m high boundary fence (i.e. impervious to light passing through), together with sensible lighting design, is capable of achieving compliance.*

APPENDIX B

LDP comments regarding submissions – Lighting

| ITEM | SUBMISSION | SUBMITTER | SUB POINT | CHAPTER | SUBJECT | ISSUE RAISED | RELIEF SOUGHT | PCS PAGE | LIGHTING COMMENTS, 08/06/22 |
|------|------------|---------------------------------------|-----------|---|---|---|---|----------|--|
| 1 | 16 | Graeme McMillan | 16.3 | Chapter 4A - Peacocke Medium Density Residential Zone | Building height near bat habitat and open space | I believe there is a risk that 5-storey buildings near to bat habitats will cause higher lighting and glare risks to bats from residential use - patios, windows etc. These risk elements may only be partly controlled by the design of the building. There is much less risk of affecting bats if the building height beside gullies/bat corridors is limited to 2-storeys. | Review of high-density zones in specific areas where bat habitat is bordered by proposed high-density on more than one side. Indicated areas should be zoned medium density. | 59 on | Comment: While I agree in principle, in practice the height differential is likely to result in little difference in effect in my opinion. I understand that bats tend to fly near the top of the canopy where trees are present. Hence, the uppermost story may be the most relevant relative to the height of nearby trees. e.g.; * approx. 6m trees: 2nd storey may have greater effect than lower/higher * approx. 17m trees: 5th storeymay have greater effect than lower/higher * >approx. 17m trees: not particularly relevant Hence, I disagree with the submitter's concern. Recommend: No change. Further Comment: Typo in title on page 58 (residnetial) |
| 2 | | | 16.4 | Chapter 25.6 Lighting and Glare | Impact of high density lighting | 25.6.2 describes how Peacocke Precinct is an important habitat for long-tail bats and that significant bat habitat areas are protected from the effects of lighting and glare but 25.6.4.4 doesn't account for the high density overlay and doesn't account for the risk of bat glare from tall buildings with patios and unshuttered windows. As written, Peacocke High Density Zone fits under section 25.6.4.5 All Other Zones, where the lux measurement is 33x higher (10 lux vs. 0.3 lux) than what applies to Peacocke Medium Density. | Add high density to 25.6.4.4. Add consideration of high density buildings on bat glare and what the appropriate controls and measures are. | 291 | Comment: Whether the plan covers high density is a matter for planning parties to determine. In terms of lighting effects, the present wording at 25.6.4.4 is not height limited, so it will capture lighting effects at any height. Recommend: No change |
| 3 | 20 | Go Eco (Waikato Environmental Centre) | 20.7 | Chapter 3A - Peacocke Structure Plan | Transportation network | There is no mention of the transportation infrastructure on a policy level in regard to mitigating the impacts on the wellbeing of the pekapeka such as maximum road width, maximum light brightness, minimum suburban tree coverage (not just in gullies), maximum street lights, commercial centre light restrictions, walking and cycle path lighting which will go through parks and gullies, and issues surrounding tree felling when a potential bat tree causes the risk to the transport system. | Specific relief sought not stated. | 41 | Comment: This is addressed in the city wide provisions - chapter 25.6 Lighting and Glare. Recommend: No change |
| 4 | | | 20.11 | Chapter 3A - Peacocke Structure Plan | DEV01-PSP Natural Environment and Open Space network (c) · Bat Habitat Buffer | This bat specific module is good news. 20m is an acceptable distance, but flexibility for what accounts for a bat significant natural area may be needed. When bats start roosting in a different area of the gully then it would become a significant natural area. The proposed style of bat corridor is 50 metres, which includes the bat buffer making habitat 30m wide which is quite limited. 0.3 lux lighting is recommended in the plan and is outlined in figures displaying habitat and road layouts. A limit on this lighting must be mandated. The number of light poles must also be mandated as if there are lots more low level lighting then benefits may be limited. | Amend to include a limit on lux lighting and a limit on the number of light poles. | 28 | Comment: In order to provide certainty, it isn't practical to change the SNA as time goes by to suit bats that choose to move into new areas. This would generate reverse sensitivity issues. The number and height of lighting columns is not directly relevant. The lux limit is addressed at rule 25.6.4.4 and is sufficient as a control over lighting effects regardless of the composition/height of the lighting structures or quantities. The current rules are sufficient in my opinion. Recommend: No change |
| 5 | | | 20.15 | Chapter 15A: Natural Open Space Zone: Peacocke Precinct | NOSZ – PREC1- P: R16 | Support the idea of community gardens. The restrictions of no lighting are good and the stipulation that no vegetation should be removed is essential. However, a statement on the practical way this can be enforced needs to be included here. | Amend NOSZ-PREC1-P:R16 to include a statement on the practical way the Rule can be enforced. | 204 | Comment: I do not see a need for an additional enforcement statement in this situation as HCC already have the tools needed for enforcement. If the land is privately owned, HCC can issue an enforcement notice. If it is public land, HCC can simply remove any such lighting. Recommend: No change |
| 6 | 21 | Transpower New Zealand Ltd | 21.6 | Appendix 17 – Planning Maps | Significant Bat Habitat Area, as it relates to 25 Hall Road | Transpower opposes the Significant Bat Habitat Area, as it relates to 25 Hall Road. In addition to the insufficient justification/reasoning for SNA 60, Transpower has concerns with the width of the Significant Bat Habitat Area and its location on 25 Hall Road. | Remove or relocate the Significant Bat Habitat Area feature from the Transpower site at 25 Hall Road. And any consequential amendments including deletion of any lighting and vegetation works standards/rules as they apply to the site. | 721, 747 | Comment: I presume that any rules would not be retrospective and such existing lighting could remain? Otherwise, the ecologists would need to consider the bat habitat value of this space and whether a dispensation could be made. An option might be to use motion sensor lighting so exterior lights are only on when needed. However, the submitter has not yet explained why they are concerned nor provided evidence to support a need for dispensation. Therefore, a need for dispensation has not been established. Recommend: No change |
| 7 | 23 | Broadwater Village Ltd | 23.16 | Chapter 25.6 Lighting and Glare | 25.6.4.4.4 | Will ensure the rule is consistent with Policies 25.6.2.2a and 25.6.2.2b. | Amend as follows: (a) Lighting from fixed sources shall not exceed 0.3 lux (horizontal and vertical) when measured at the external boundary of the Significant Bat Habitat Area. | 291 | Comment: I agree that there is presently the potential for artificial lighting to be incorrectly interpreted as moving as well as fixed. However, since this is Peacocke specific it should be part of 25.6.4.4 Recommend: See proposed item b) in comments at sub-point 30.4 |
| 8 | 25 | ID and EM Williams Ltd | 25.3 | Chapter 25.6 Lighting and Glare | Prevent excessive glare | We support the council's changes outlined in 25.6. We have also planted many bat friendly trees to encourage bats into our gully. To have them frightened aware by excessive glare must also be prevented. | Retain as notified. | 289 | Comment: Agreed. Recommend: No change |

| ITEM | SUBMISSION | SUBMITTER | SUB POINT | CHAPTER | SUBJECT | ISSUE RAISED | RELIEF SOUGHT | PCS PAGE | LIGHTING COMMENTS, 08/06/22 |
|------|------------|---------------|---------------|---------|----------------|--|--|----------|---|
| 9 | 30 | Andrea Graves | 30.4 | General | Bat Protection | There needs to be clear direction that lighting from any building, street lighting, outdoor lighting or vehicle headlights must not exceed 0.1 lux within 3m of the edge of any high-value bat habitat, as was traversed in Court. The Court also made clear that a 2,700 kelvin limit is appropriate for public roads at [66]. These limits should be a core part of the Plan Change. At present there are only vague statements in the Chapter 25 objectives and policies. Words like 'useability' (25.6.2.2a) and 'minimise' (25.6.2.2b) are easily contested and defended with difficulty. It must be made clear how these limits are to be monitored and maintained. | Include clear direction that lighting from any building, street lighting, outdoor lighting or vehicle headlights must not exceed 0.1 lux within 3m of the edge of any high-value bat habitat. Amend the objectives and policies in Chapter 25 (25.6.2) to reflect the Environment Court observation that a 2,700 kelvin limit is appropriate for public roads. Include a requirement for quarterly inspections with developers contributing to a fund to fund inspections in perpetuity. | 291 | Comment: I agree that the current wording could be improved for clarity and to better align with the Environment Court decision referenced by the submitter. The concept of requiring the developer to pay for anything 'in perpetuity' is not feasible as their responsibilities end with the sale of private property and the vesting of public space to Council (other than legal obligations which are limited to 10 years under NZ law). Hence, upon sale/vesting, HCC & the private property purchasers become responsible for ongoing compliance for their respective assets. Fixed lighting, if limited to the HCC proposed 0.3 lux limit at the SBHA boundary, will automatically ensure that illuminance will be below 0.1 lux at the Significant Bat Habitat (i.e. beyond the 20m buffer zone). The SBHA boundary is a more practical assessment point for measurement and control than a location within a vegetated area. |
| | | | 30.4 (cont'd) | | | | | | Recommend: <i>Modify section 25.6.4.4 as follows to align with the elements of the Amberfield EC decision conditions insofar as they relate to the wider Peacocke area;</i> <i>a) Added illuminance from artificial outdoor lighting shall not exceed 0.3 lux (horizontal and vertical) at any height at the external boundary of the Significant Bat Habitat Area (SBHA).</i> <i>b) Artificial outdoor lighting shall be fixed artificial outdoor lighting. Lighting attached to a vehicle is not considered to be fixed.</i> <i>c) Artificial outdoor lighting on land adjoining a SBHA, including land immediately on the opposite side of a road which adjoins a SBHA, must;</i> <i>i) Emit zero direct upward light.</i> <i>ii) Be installed with the light emitting surface facing directly down and be mounted as low as practical.</i> <i>iii) Be white LED with a maximum colour temperature of;</i> <ul style="list-style-type: none"> • 3000K for land with a residential use where separated from a SBHA by a public road with 2700K lighting • 2700K for land with a residential use directly abutting a SBHA • 2700K for all other uses <i>iv) In the case of exterior security lighting, be controlled by a motion sensor with a short duration timer (5 minutes).</i> <i>d) Artificial outdoor lighting within a SBHA is only permitted for the express use of providing emergency lighting for an essential public service that could require unavoidable maintenance at night – e.g. a waste water pumping station. The lighting must be white LED with a maximum 2700K colour temperature, installed with the light emitting surface facing directly down, emit zero direct upward light and be mounted as low as practical.</i> |
| 10 | | | 30.5 | General | Bat Protection | There is a need for screening of high-value bat habitats to outweigh and be prioritised over views, line-of-sight safety considerations, amenity and recreational use. This must be spelt out clearly and at a high-level. The priority must clearly be stated to lie with the bats. The Overview and Vision of Chapter 3 Structure Plans states that 'Subdivision is designed to respond to the gully network and areas of open space ensuring that where these are accessible to the public and they are visible and safe'. DEV01-PSP: O16 and DEV01-PSP: P5 refer to the sharing of spaces. These co-uses should be considered but should be rejected if the biodiversity values of SNAs will be undermined by requirements that come with recreational co-use. Visible and safe to people means exposed and unscreened to bats if there is any nearby lighting or vehicle lights at night. | Include requirement for screening of high-value bat habitats which take priority over views, line-of-sight safety considerations, amenity and recreational co-use. Rename the gullies and other high-value bat habitat areas 'bat priority areas'. Chapter 3 Structure Plans: Amend DEV01-PSP: COMPONENTS OF THE PEACOCKE STRUCTURE PLAN: Natural Environment and Open Space Network b) to include: To give effect to (a) above in terms of protecting the long-tailed bat and its habitat, any conflict over use requirements will fall in favour of design choices that prioritise bats rather than recreational or transport provisions. Amend DEV01-PSP: COMPONENTS OF THE PEACOCKE STRUCTURE PLAN: Natural Environment and Open Space Network c) Bat Habitat Buffer to include: If there is any conflict of design choices between biodiversity values in SNAs or the buffers around them and recreational or pedestrian facilities, the choices will fall in favour of prioritising support and protection of biodiversity values. Chapter 15 Open Space Zones: Amend NOSZ – PREC1- P: O4 as follows: Open spaces are used and developed in a way that minimises adverse effects on the surrounding environment. Amend NOSZ – PREC1-P:P7 as follows: Public access, walkways and cycleways shall be maintained and enhanced within areas of open space, provided that adverse effects on the amenity, natural and heritage values of those areas are minimised avoided. Amend NOSZ – PREC1-P:P8 as follows: Open space shall be designed and developed to ensure a safe physical environment by: i. Providing clear sightlines that maximise visibility of public areas, provided that natural values are not compromised acknowledging that in sensitive locations the requirement to prioritise biodiversity outweighs the desirability of clear sightlines. | 291 | Comment: This is a topic that has implications beyond lighting effects. Care is required to avoid unsafe situations in relation to CPTED (Crime Prevention Through Environmental Design). In the course of the EC hearing mentioned by the submitter, it was noted by expert witnesses that screening adjacent the BPA was not essential and the other lighting control measures would suffice to ensure that no more than 0.1 lux was received at the tree line within the BPA without any such screening. Vehicle headlights in built up areas are invariably dipped to low beam and do not tend to persist as the vehicle typically moves past any given location within a matter of seconds. Experts provided testimony to the EC, based on monitoring undertaken over multiple sites over a number of years, that bats persist in the presence of headlights. Recommend: <i>No change</i> |

| ITEM | SUBMISSION | SUBMITTER | SUB POINT | CHAPTER | SUBJECT | ISSUE RAISED | RELIEF SOUGHT | PCS PAGE | LIGHTING COMMENTS, 08/06/22 |
|------|------------|----------------------------------|-----------|--------------------------------------|---|---|--|----------|---|
| 11 | | | 30.13 | General | Bat Protection | Chapter 3 Structure Plans DEV01-PSP: P13 states that higher density development may be provided along areas of natural open space including the river corridor and gully network. These are key areas where biodiversity values, particularly for bats, are the highest priority. The extra lighting associated with higher density development must be considered when deciding whether these are appropriate areas. DEV01-PSP: P23 appears to confirm this. | Specific relief sought not stated. General relief seeks that lighting standards be prioritised in higher density areas. | 35 | Comment: Addressed by my recommendations at 30.4 Recommend: <i>As noted at 30.4</i> |
| 12 | | | 30.20 | Chapter 25.6 Lighting and Glare | 25.6 Lighting and Glare | The submitter has incorporated comments into my additional information on the previous chapters about the vague nature of lighting and glare considerations for the bats, despite the clear evidence from experts and conclusions from the Environment Court Amberfield hearings. This relates mainly to lux limits and the need to monitor these on an ongoing basis. | Alter the bat-relevant provisions to recognise the Court's Decision for Amberfield. | 289 on | Comment: Addressed by my recommendations at 30.4 Recommend: <i>As noted at 30.4</i> |
| 13 | 36 | Waikato Regional Council | 36.59 | Chapter 25.6 Lighting and Glare | Objective 25.6.2.2 | The design and management of lighting is one of the key factors in protecting the habitat of NZ long-tailed bat. This section notes that bats are particularly sensitive to light, which has the potential to inhibit their movement and feeding habits. The objective could be reworded to clarify that the outcome required is to protect bats from the adverse effects of lighting. The Objective gives effect to WRPS policy 11.1 i) and Policy 11.2. | Reword Objective as follows: Identified bat habitat in Peacocke is protected from the adverse effects of lighting and glare. | 289 | Comment: In my opinion, the current wording adequately addresses the submitter's concern. Recommendation: <i>No change</i> |
| 14 | | | 36.60 | Chapter 25.6 Lighting and Glare | Policies 25.6.2.2a and 25.6.2.2b | These policies provide more detailed guidance around design, light spill, and glare in relation to boundary of bat habitat and fixed lighting. | Retain as notified. | 289 | Comment: Agreed. Recommend: <i>No change</i> |
| 15 | | | 36.61 | Chapter 25.6 Lighting and Glare | 25.6.4.4 Specific standards Peacocke Medium Density Zone. | Appendix Q supporting the Peacocke Structure Plan Change provides the basis and rationale for informing bat sensitive lighting rules. This standard has been set at 0.3 lux. At the recent Amberfield Subdivision Environment Court hearing it was discovered that, while 2700K luminaires are obtainable for commercial luminaires (e.g., roadway lights), residential outdoor luminaires are invariably available with a minimum of 3000K colour temperature. The report notes that the rationale for 2700K emanates from a desire to minimise the 'blue' content and there are only a few percentage points difference in that regard between 2700K and 3000K. Therefore, the 'permitted activity' for residential lots mandates 3000K, but the report notes to include a preference for 2700K in the Guidance notes. | Amend the lighting standard to reflect the preference for 0.27 lux OR Amend the lighting standard to differentiate between commercial lighting standard = 0.27 lux and residential lighting standard = 0.3 lux. | 291 | Comment: The current 0.3 lux limit should remain for all uses. I am not aware of any illuminance meter that can measure a difference of 0.03 lux, so a limit of 0.27 lux would in practice still be a limit of 0.3 lux. Also, there is no direct association between correlated colour temperature and illuminance. There is also very little difference in blue light content between LED's at 2700K vs 3000K. The Amberfield EC decision accepted the use of 3000K for residential lighting and 2700K elsewhere, applying the same 0.3 lux limit in each case. The submitter may wish to review the evidence and transcript of the EC case if they wish to see additional background. Recommend: <i>No change</i> |
| 16 | 38 | Director-General of Conservation | 38.10 | General | Roads | The Director-General is concerned that Bat Priority Areas will adjoin or intersect with sections of the roading network in the PSPA. This is likely to have an adverse impact on longtailed bats and their habitat if roads are inappropriately designed and located. | Consider relocation of roading sections that cross Bat Priority Areas and introduce Policies and Rules to avoid and minimise the effect of road lighting and light emission from vehicle headlights on Long-tailed bats and their habitat. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 45, 291 | Comment: Rule 25.6.4.4 does not exclude road lighting. It is therefore required to meet the rule within the Peacocke Precinct. It is impractical to completely prevent vehicle headlight effects and it was established at the Amberfield EC hearing mentioned in previous submissions that bats persist in the presence of headlights. [Note: The submitter's phrase "Any other amendments..." commonly appended at the end of each submission point is not specific and therefore cannot be specifically commented upon. However, in each case I have considered the broader picture and could not identify any need for further amendment. This comment applies to all of the sub-points raised in submission 38.] Recommend: <i>No change</i> |
| 17 | | | 38.33 | Chapter 3A - Peacocke Structure Plan | Additional Policy to address connectivity of bat habitat | The Director-General requests a further transportation policy directing that the transport network will be designed to avoid adverse effects on long-tailed bats and their habitat by using such methods as a maximum artificial light spill from street lighting, maximum colour temperature for lights of 2700 K, planting to provide 'hop-overs', and screening planting along the sides of roads to reduce the adverse impact of headlight spill-over into long-tailed bat habitat. The Director-General notes that design of the transportation network needs to integrate with and account for the effects mitigation and offsetting measures being undertaken as part of the Southern Links project. In planning for the Peacocke transport network it should be acknowledged that together with the Southern Links Road there will be cumulative effect on long-tailed bats that needs to be minimised. | Add policy: The transport network, including the Southern Links Road is designed to promote the physical and functional connectivity of long-tailed bat habitat. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 43, 294 | Comment: Refer comments at sub-point 38.10. Also, Transport Policy 25.14.2.1c addresses adverse effects and references biodiversity. Lighting effects are adequately captured in chapter 25.6 in my opinion. However, the suggested amendment is also a planning & transport matter for consideration within DEV01-PSP Recommend: <i>No change (with respect to lighting effects).</i> |
| 18 | | | 38.36 | Chapter 3A - Peacocke Structure Plan | 5m buffer | The Director-General considers there needs to be consistency between the Amberfield subdivision and the Peacocke Structure Plan. To achieve this consistency the 5-metre setback area would have no buildings minimal external lighting within it. | Amend the bullet point addressing Development setback. Change the wording to: Along with the Bat Habitat Area <u>Bat Priority Area</u> a 5m development setback is proposed along the interface with the Bat Habitat Area <u>Bat Priority Area</u> . The setback aims to <u>avoid the location of external buildings and minimise the spill of external lighting</u> and associated effects on the adjoining bat habitat areas. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 42 | Comment: My understanding is that the 5m development setback, by definition, means no buildings. The lighting effects are adequately addressed by Chapter 25.6, provided my recommendations at sub-point 30.4 are incorporated. Recommend: <i>No change</i> |

| ITEM | SUBMISSION | SUBMITTER | SUB POINT | CHAPTER | SUBJECT | ISSUE RAISED | RELIEF SOUGHT | PCS PAGE | LIGHTING COMMENTS, 08/06/22 |
|------|------------|-----------|-----------|---|--|---|---|----------|--|
| 19 | | | 38.37 | Chapter 3A - Peacocke Structure Plan | Lighting controls | The Director-General considers there needs to be consistency between the Amberfield subdivision and the Peacocke Structure Plan. The maximum light level applying in the Amberfield subdivision consent is 0.1 lux 3 metres inside the boundary of Bat Priority Areas. The Director-General requests that the paragraph dealing with lighting controls be amended to refer to standards to avoid artificial light spill from buildings and roads, including maximum lux levels and colour temperatures, and buffer planting for light screening. | Change the wording to: Controls over lighting to protect the functional attributes of the habitats in relation to surrounding land use change from rural to urban. These controls relate to <u>avoidance of artificial light spill from buildings and roads, including maximum lux levels and colour temperatures, and buffer planting for light screening</u> managing the impact lighting may have on the ability for the so that Bat Habitat Areas-Bat Priority Areas to remain dark spaces allowing bats to continue to use these areas as Peacocke urbanises. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 42 | Comment: The intent of the Amberfield EC decision was to ensure that artificial light reaching a bat habitat would not exceed 0.1 lux. In the case of PC5, the proposed 0.3 lux limit at the boundary of the SBHA (i.e. after the 20m buffer) will automatically ensure that light reaching the bat habitat will be well below 0.1 lux. Hence, the PC5 limit is in fact more conservative in terms of spill light than the Amberfield EC decision. Recommend: No change |
| 20 | | | 38.39 | Chapter 3A - Peacocke Structure Plan | Sports park | It is unclear in this discussion how the operation of the major sports park will be compatible with the protection of long-tailed bats if night lighting is used at the park. | Change the wording to: Include discussion of how operation of the major sports park will be compatible with the protection of long-tailed bats if night lighting is used at the park. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 44 | Comment: In my opinion, the present wording is adequate. Policies at Chapter 25.6.2 (Objectives and Policies: Lighting and Glare) provide more detail. The lighting effect constraints with rule 25.6.4.4 (as amended by my recommendations at sub-point 30.4) are adequate to address a sports field within the Peacocke Precinct. Recommend: No change |
| 21 | | | 38.42 | Chapter 4A - Peacocke Medium Density Residential Zone | MRZ-PREC1-PSP Rules | The rules generally provide for permitted activities that comply with the standards set out in the rules R36 to R48. These standards do not provide adequately for protection of long-tailed bats and their habitats, including no restriction on the removal of actual and potential roost trees, no prohibition on external lights within the 5-metre building setback, and no rule on the keeping of domestic cats. The Director-General considers these rules should apply across all zones in the PSPA. It is noted that a lighting standard has been added to the City-Wide Chapter 25.6 Lighting and Glare. The Director-General considers this should be referenced within the rule's framework in Chapters 4A and 23A for clarity. | Add Rules: To address the removal of actual and potential roost trees, prohibition of external lights within the 5-metre building setback, and no rule on the keeping of domestic cats. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 66 on | Comment: It might be helpful to cross reference the relevant rules (i.e. such as lighting), but that and other matters raised by the submitter at this sub-point are matters for consideration by planning specialists. Whether there are lights in the 5m setback zone or not, the lighting effects within the SBHA will be adequately controlled by rule 25.6.4.4. Recommend: Lighting - No change. Planning matters - for planning specialists to address. |
| 22 | | | 38.45 | Chapter 4A - Peacocke Medium Density Residential Zone | MRZ - PREC1- PSP: P21 | The Director-General requests Policy MRZ - PREC1- PSP: P21 be amended to protect long-tailed bats and their habitat from the effects of lighting. | Change the wording to: Residential development is designed to manage avoid adverse lighting effects on adjacent areas of Natural Open Space long-tailed bat habitat by requiring measures such as, a ban on domestic cats, controls on the removal of actual and potential roost trees, and buffer planting. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 64 | Comment: In my opinion, the present wording provides sufficient clarity. Recommend: No change (with respect to lighting) |
| 23 | | | 38.46 | Chapter 23A Subdivision: Peacocke Precinct | SUB – PREC1-PSP: RULES – Activity Status | These rules do not provide adequately for protection of long-tailed bats and their habitats, including no restriction on the removal of actual and potential roost trees, no prohibition on external lights within the 5-metre building setback, and no rule on the keeping of domestic cats. The Director-General considers these rules should apply across all zones in the PSPA. It is noted that a lighting standard has been added to the City-Wide Chapter 25.6 Lighting and Glare. The Director-General considers this should be referenced within the rule's framework in Chapters 4A and 23A for clarity. | Add Rules: To address the removal of actual and potential roost trees, prohibition of external lights within the 5-metre building setback, and no rule on the keeping of domestic cats. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 66, 364 | Comment: Refer to comments at sub-point 38.42 Recommend: No change (with respect to lighting) |
| 24 | | | 38.48 | Chapter 15A: Natural Open Space Zone: Peacocke Precinct | NOSZ – PREC1- P: P18 | The Director-General is generally supportive of Policy NOSZ – PREC1- P: P18 but considers it could be strengthened by amending clause 2 to provide for enhancement of habitat as well as extending clause 3 by listing the important adverse effects to avoid. It is also unclear how ensuring access to long-tailed bat habitat is necessary for their protection as appears to be inferred in clause 1). | Change the wording to: Identify and manage areas of Natural Open Space in the Peacocke Structure Plan to: 1) Ensure the <u>protection and enhancement and access to</u> of identified habitat of long-tailed bats; 2) Provide habitat and connections for long tailed bats; 3) <u>Avoid</u> the <u>adverse</u> effects of development on the habitat of long-tailed bats; <u>By:</u> <u>a) avoiding the adverse effects of lighting and noise within the Bat Priority Areas;</u> <u>b) protecting bats from predation;</u> <u>c) banning ownership of cats and mustelids within the Peacocke Structure Plan Area;</u> <u>d) protecting roosting sites within the Bat Priority Areas; and</u> <u>e) avoiding injury and/or mortality of roosting long-tailed bats during any tree removal.</u> Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 200 | Comment: This appears to be a planning matter. Recommend: No change (in relation to lighting) unless determined otherwise by the planners. |
| 25 | | | 38.60 | Chapter 23A Subdivision: Peacocke Precinct | SUB – PREC1-PSP: RULES | These rules do not provide adequately for protection of long-tailed bats and their habitats, including no restriction on the removal of actual and potential roost trees, no prohibition on external lights within the 5-metre building setback, and no rule on the keeping of domestic cats. The Director-General considers these rules should apply across all zones in the PSPA. It is noted that a lighting standard has been added to the City-Wide Chapter 25.6 Lighting and Glare. The Director-General considers this should be referenced within the rule's framework in Chapters 4A and 23A for clarity. | Add Rules: To address the removal of actual and potential roost trees, prohibition of external lights within the 5-metre building setback, and no rule on the keeping of domestic cats. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 265 | Comment: Addressed by my recommendations at 30.4 & 38.42. Recommend: As noted at 30.4 |

| ITEM | SUBMISSION | SUBMITTER | SUB POINT | CHAPTER | SUBJECT | ISSUE RAISED | RELIEF SOUGHT | PCS PAGE | LIGHTING COMMENTS, 08/06/22 |
|------|------------|-----------|-----------|---------------------------------------|--|---|---|----------|--|
| 26 | | | 38.62 | Chapter 25.6 Lighting and Glare | Objective 25.6.2.2 | | Amend as follows: Lighting in the Peacocke Structure Plan Area is managed to ensure areas identified as Significant Bat Habitat <u>Bat Priority Areas</u> retain their usability and functionality for bat activity. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 289 | Comment: Provided the terminology is consistent throughout the District Plan, there is no need to change in my opinion. However, this is also a matter for planning & ecology specialists to consider. Recommend: <i>No change</i> |
| 27 | | | 38.63 | Chapter 25.6 Lighting and Glare | Policy 25.6.2.2a | | Amend as follows: Manage light spill and glare of fixed lighting at the boundary of the Significant Bat Habitat <u>Bat Priority Areas</u> to ensure that the useability of long-tailed bat habitat is maintained. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 289 | Comment: Refer comments at sub-point 38.62. Recommend: <i>No change</i> |
| 28 | | | 38.64 | Chapter 25.6 Lighting and Glare | Policy 25.6.2.2b | | Amend policy to replace the phrase "the Significant Bat Habitat" with the phrase "Bat Priority Areas". Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 289 | Comment: Refer comments at sub-point 38.62. Recommend: <i>No change</i> |
| 29 | | | 38.65 | Chapter 25.6 Lighting and Glare | Additional standards | The Director-General submits that additional lighting standards should be added to create a bat-sensitive road lighting regime adjacent to Bat Priority Areas to minimise spill into Bat Priority Areas. | Add standards requiring that sections of road adjacent to Bat Priority Areas avoid adverse effects on long-tailed bats and their habitat by requiring maximum artificial light spill from street lighting, maximum colour temperature for lights of 2700 K, planting to provide 'hop-overs', and screening planting along the sides of roads to reduce the adverse impact of headlight spill-over into long-tailed bat habitat. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 289 on | Comment: I agree, with respect to lighting controls. The need for screening and/or hop-overs is a matter for broader group discussion. Recommend: <i>Refer to my recommendations at sub-point 30.4</i> |
| 30 | | | 38.66 | Chapter 25.6 Lighting and Glare | 25.6.4.4 Peacocke Medium Density Zone: Peacocke Precinct | The Director-General submits there should be consistency between the Amberfield subdivision and the Peacocke Structure Plan. Residential lighting within the Amberfield subdivision is restricted to a bat friendly 0.1 lux 3 meters from the inside of the Bat Priority Area boundary. The agreed maximum lighting colour temperature for Amberfield was 2700k. 25.6.4.4 lighting standard should also apply to subdivision occurring in the wider Peacocke Precinct, not just those areas zoned for medium density development. | Ensure consistency between the Amberfield subdivision lighting requirements and the Peacockes precinct. Amend the lighting standard to apply to the entire Peacocke precinct, not just areas zoned for medium density development. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 291 | Comment: I agree in general, but note that 3000K was adopted for residential exterior lighting rather than 2700K Recommend: <i>Refer to my recommendations at sub-point 30.4</i> |
| 31 | | | 38.72 | Appendix 1.2 Information Requirements | 1.2.2.27 | The Director-General considers the Bat Management Plan (BMP) should be amended with clear objectives and measures to avoid and remedy as well as mitigate the effects of development on long-tailed bats. | Make amendments to the BMP to provide clear objectives for management of longtailed bats across the PSPA, these should aim: a) To protect bat habitat and roosts by avoiding adverse effects on the function of their habitat, in terms of commuting, foraging and socialisation. b) To enhance the values and attributes of bat habitat; To achieve the objectives the following amendments are suggested: i. Vegetation removal protocols for trees with a diameter at breast height (DBH) of 15cm or greater should be employed for trees located within and outside of the identified bat habitat area. ii. A BMP being required for areas outside significant bat habitat that contain potential or identified bat habitat. iii. When a BMP is required, it is submitted to HCC with the relevant resource consent application. iv. A Bat and Habitat Enhancement Panel should be consulted on the draft BMP and comments incorporated or a justification provided to Council as to why they were not incorporated. v. The BMP would link to all other areas within the PSPA to create a consistent approach. vi. While the BMP focuses on mitigation it should also outline measures to avoid and remedy bat values and offset or compensate where this is not possible. Roost tree protection should also be included in the BMP for identified or potential roost trees. vii. The BMP should address residual adverse effects on bats to achieve a net biodiversity gain such as habitat enhancement and targeted predator control that achieves residual pest indices relevant to bat conservation. Notwithstanding the above recommended changes, the BMP should, as a minimum, include the same bat management protocols listed in the conditions of the Amberfield Resource Consent such as: i. Interaction with | 427 | Comment: This is generally a matter for consideration by ecologists and planners. However, if the proposal is adopted, the lighting reference should be modified to suit my recommendations at sub-point 30.4. Recommend: <i>If Council elects to adopt this proposal, modify item vii - bullet point 1, to align with my recommendations at sub-point 30.4</i> |
| 32 | | | 38.73 | Appendix 1.3 Assessment Criteria | Assessment Criteria P3 (e) | The Director-General submits that the extent to which ecological function is enhanced should be a matter of discretion. | Change the wording to: P3 (e) The extent to which development is designed to respond to ecological corridors and habitat, and ensures they protect and maintain <u>enhance</u> the ecological function of these corridors; including the management of lighting and building location. | 473 | Comment: While desirable in an aspirational sense, to "enhance" is likely an impossibly high goal to achieve and therefore should not be set as a required outcome. In my opinion, the current wording is adequate. Recommend: <i>No change</i> |
| 33 | | | 38.74 | Appendix 1.3 Assessment Criteria | Assessment Criteria P3 (i) | The Director-General submits that the extent to which light has been designed and located to protect and enhance adverse effects on the function and quality of long-tailed bat habitat should be a matter of discretion. This will better align with the mitigation hierarchy as set out in the WRPS and give effect to Section 6(c) of the RMA. | Change the wording to: P3 (i) The extent to which lighting has been designed and located to maintain <u>protect and enhance</u> the function and quality of longtailed bat habitat. Any other amendments that may be necessary or appropriate to address the submitter's concerns. | 474 | Comment: As per comments at sub-point 38.73 Recommend: <i>No change</i> |

| ITEM | SUBMISSION | SUBMITTER | SUB POINT | CHAPTER | SUBJECT | ISSUE RAISED | RELIEF SOUGHT | PC5 PAGE | LIGHTING COMMENTS, 08/06/22 |
|------|------------|---|-----------|---|---|--|--|----------|--|
| 34 | 46 | Ben and Rachel Inger | 46.4 | Chapter 15A: Natural Open Space Zone: Peacocke Precinct | Chapter 15A, NOSZ – PREC1- P: ISSUES | Although most of the Natural Open Space Zone within the Peacocke Structure Plan area is currently privately owned, the Natural Open Space Zone (including Bat Habitat Areas) should logically be public reserves so that they can be set aside for public protection and enhancement and so that they can be used for other purposes, such as public paths and playgrounds which are shown on the Proposed Bat Corridor diagram in Chapter 3A. This should be clearly stated to remove the ambiguity that currently exists. The issues statement should be clear that Bat Habitat Areas are locations where habitat is proposed to be created and that the purpose of this is to mitigate effects of urban development on the long-tailed bat within Peacocke. Recognising, however, that the long-tailed bat's habitat home range is located across most of Hamilton City and surrounding environments and the required habitat creation will also contribute to the mitigation of existing effects of urbanisation in other parts of Hamilton City on the long-tailed bat. | Amend Chapter 15A, NOSZ – PREC1- P: ISSUES as follows: "The Natural Open Space Zone includes publicly and privately owned areas that possess natural or landscape values or that are locations where Bat Habitat Areas are proposed to be created to mitigate potential effects of urban development within the Peacocke Structure Plan area. The Natural Open Space zoned areas will be acquired as public reserves." | 197 | No comment, as this is not directly a lighting matter |
| | | | 46.6 | Chapter 25.6 Lighting and Glare | Rule 25.6.4.4 Peacocke Medium Density Zone: Peacocke Precinct | The proposed amendments achieve consistency with Policies 25.6.2.2a and 25.6.2.2b which refer specifically to "fixed lighting". | That Rule 25.6.4.4 Peacocke Medium Density Zone: Peacocke Precinct be amended as follows: "Lighting from fixed sources shall not exceed 0.3 lux (horizontal and vertical) when measured at the external boundary of the Significant Bat Habitat Area." | | Comment: I agree with the recommendation but suggest modified wording as noted in my comments at sub-points 23.16 & 30.4 Recommend: Adjust as per my recommendations at sub-points 23.16 & 30.4 |
| 35 | 53 | The Adare Company | 53.51 | Chapter 6B: Peacocke Local Centre Zone | Rule LCZ – PREC1- PSP: R38 Terrace House(Peacocke Precinct) 2ndcolumn | Structure Plan Figure 2-3b identifies Primary and Secondary Frontages within the Local Centre. In these areas it is important to maintain the continuity of commercial frontage and streetscape. Outside of these areas, depending on the uptake of commercial development and design factors, it is more appropriate to maintain flexibility to have residential activity at ground level. This flexibility is better provided for by a Discretionary Activity than a Non-complying Activity Status. | Amend LCZ – PREC1-PSP: R38 to read: Activity Status: Non Complying Activity Status: Discretionary at ground floor and above outside of the Primary and Secondary Frontages. | 188 | No comment, as this is not directly a lighting matter |
| 36 | | | 53.82 | Chapter 25.6 Lighting and Glare | Rule 25.6.4.4 | Policies 25.6.2.2a and b make it clear that the purpose of the rule is to be about "fixed lighting". This rule needs amendment to be consistent with this approach. | Amend Rule 25.6.4.4 to read: "Lighting from fixed sources shall not exceed 0.3 lux (horizontal and vertical) when measured at the external boundary of the Significant Bat Habitat Area." | 291 | Comment: I agree in principle, but propose modified wording for the reasons mentioned at sub-points 23.16 & 30.4. Recommend: Refer to my recommendations at sub-points 23.16 & 30.4 |
| 37 | 55 | Kāinga Ora | 55.389 | Chapter 25.6 Lighting and Glare | 25.6.2 Objectives and Policies: Lighting and Glare | Kāinga Ora generally supports these provisions but considers that safety of the community is paramount and should be reflected in the objectives and policies. | Amend as follows: 25.6.2.2a Manage light spill and glare of fixed lighting at the boundary of the Significant Bat Habitat Area to ensure that the useability of long-tailed bat habitat is maintained while maintaining safety on adjoining properties. 25.6.2.2b Ensure that fixed lighting in public spaces, such as parks and road corridors is designed to minimise the effects of lighting and glare on Significant Bat Habitat Area while also achieving a safe public realm for the community. Explanation: The Peacocke Precinct is an important habitat for long-tail bats which are a threatened native species. Due to the presence of bats in the area, it is important the effects of development are managed to ensure bats are able to continue to move and forage through the area. This needs to be balanced against the safety needs of the community. Bats are particularly sensitive to light, which has the potential to inhibit their movement and feeding habits. For this reason, it is important that those area of Peacocke identified as being Significant Bat Habitat Areas are protected from the effects of excessive lighting and glare. | 289 | Comment: I agree with the proposed amendments. Recommend: Accept submitter's proposed amendments |
| 38 | 58 | Harvey Aughton- Go Eco (Waikato Environmental Centre) | 58.7 | Chapter 3A - Peacocke Structure Plan | Transportation network | There is no mention of the transportation infrastructure on a policy level in regard to mitigating the impacts on the wellbeing of the pekapeka such as maximum road width, maximum light brightness, minimum suburban tree coverage (not just in gullies), maximum street lights, commercial centre light restrictions, walking and cycle path lighting which will go through parks and gullies, and issues surrounding tree felling when a potential bat tree causes the risk to the transport system. | Specific relief sought not stated. | 37 | Comment: The concerns raised appear to be adequately addressed by rule 25.6.4.4 as amended by my recommendations at sub-point 30.4. Recommend: No change |
| 39 | | | 58.11 | Chapter 3A - Peacocke Structure Plan | DEV01-PSP Natural Environment and Open Space network (c) · Bat Habitat Buffer | This bat specific module is good news. 20m is an acceptable distance, but flexibility for what accounts for a bat significant natural area may be needed. When bats start roosting in a different area of the gully then it would become a significant natural area. The proposed style of bat corridor is 50 metres, which includes the bat buffer making habitat 30m wide which is quite limited. 0.3 lux lighting is recommended in the plan and is outlined in figures displaying habitat and road layouts. A limit on this lighting must be mandated. The number of light poles must also be mandated as if there are lots more low level lighting then benefits may be limited. | Amend to include a limit on lux lighting and a limit on the number of light poles. | 41 | Comment: Specific lighting requirements are addressed in Rules rather than Policies. The number of light poles are irrelevant. Refer comments at sub-point 30.4. Recommend: No change |
| 40 | | | 58.15 | Chapter 15A: Natural Open Space Zone: Peacocke Precinct | NOSZ – PREC1- P: R16 | Support the idea of community gardens. The restrictions of no lighting are good and the stipulation that no vegetation should be removed is essential. However, a statement on the practical way this can be enforced needs to be included here. | Amend NOSZ-PREC1-P:R16 to include a statement on the practical way the Rule can be enforced. | 204 | Comment: Refer comments at sub-point 20.15. Recommend: No change |