

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

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

Dated 22 September 2022

LACHLAN MULDOWNY

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. My qualifications and experience are as set out in paragraphs 3 to 8 of my primary statement of evidence dated 2 September 2022 (**primary evidence**).
3. I reconfirm that I have read and am familiar with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014 and I agree to comply with it.
4. I have prepared this rebuttal statement of evidence on behalf of Hamilton City Council (**HCC**) as the proponent of Plan Change 5 (**PC5**).

PURPOSE AND SCOPE OF EVIDENCE

5. The purpose of this rebuttal statement of evidence is to respond to substantive matters raised in the lighting evidence of Susan Mander for the Director-General of Conservation (**DOC**) dated 16 September 2022.
6. Where matters raised have been dealt with in my previous reports and/or evidence, I have not elaborated on such matters in my rebuttal, nor have I addressed matters of opinion or fact, where I have a different view, unless relevant to the conclusions and recommendations made in the evidence of Ms Mander.

SUBSTANTIVE MATTERS

Ms Mander's comments on Section 42A Report

7. At paragraph 12.1 of her evidence, Ms Mander takes issue with Chapter 25.6 which does not define glare metrics.

8. Chapter 25 contains city-wide rules. There is only scope within PC5 to address the Peacocke Structure Plan Area (**PSPA**). In that regard, glare is constrained by defining that lights adjacent the Significant Bat Habitat Area (**SBHA**) must be aimed directly down, thereby automatically applying sufficient glare constraint.
9. At paragraph 12.2, Ms Mander refers to Policy 25.6.2.2a and recommends that the safety needs of the community and their subsequent effects on lighting design be defined.
10. This will vary on a case-by-case basis and is a matter for resolution by the applicable design team professionals in conjunction with HCC. In my view, it would be impractical and inappropriate to mandate PSPA-wide rules in this regard.
11. At paragraph 12.3, Ms Mander states that the advisory note does not explain why added illuminance has been used nor why a threshold of 0.3 lux limit has been set in Rule 25.6.4.4a.
12. In my view, there is no necessity to explain the basis for the rule, nor is it required in order to interpret it.
13. At paragraph 12.4, Ms Mander recommends that Rule 25.6.4.4a be amended to clarify when an illuminance meter may be used.
14. I agree with Ms Mander that the majority of the time, compliance would be assessed at the time of design by calculation rather than measurement. Measurement is typically undertaken by an experienced lighting specialist when required to confirm compliance – for example to review an enforcement complaint. In my view, a suitably qualified person will be capable of interpreting and applying the rule as drafted. There is a very

similarly worded rule in the Auckland Unitary Plan.¹ It has proven to be practical to use.

15. At paragraph 12.5, Ms Mander refers to Rule 25.6.4.4c and states that The International Dark-Sky Association (**IDA**) 5 principles for lighting should be applied, universally in PC5.
16. The IDA recommendation is a guideline for good practice to protect the night sky. In my view, the principles have been addressed as far as is practical and applicable in the plan change.
17. At paragraph 12.7, Ms Mander refers to Rule 25.6.4c iii) and recommends that a value of 2700K be applied universally.
18. I am of a different view. This is discussed later in my rebuttal evidence at paragraph 28 c) below.
19. At paragraph 12.8, Ms Mander refers to Rule 25.6.4.4c iv) and states her preference for sensor lights to be of 1 minute duration rather than a 5-minute duration.
20. In my view, 1 minute is too short for practical use and such lights are unlikely to be used with great frequency. On that basis, I consider that a 5-minute duration is appropriate.
21. In paragraph 12.9, Ms Mander refers to the proposed advisory note associated with Rule 25.6.4.4 and states that note 2 should read 0.01 lux rather than 100.1 lux.
22. I agree. There is a typographic error and I also agree that 0.01 lux is practical and more appropriate than the originally intended 0.1 lux.

¹ Chapter E24.6.1 (6) (a).

23. At paragraph 12.10, Ms Mander refers to Rule 25.10.5.7 and notes that the night time 350cd/m² luminance limit for signs in the “Neighbourhood Centre Zone – Peacocke and Local Centre Zone – Peacocke” is higher than the building façade luminance limits in the Auckland Unitary Plan. She states that the permissibility of lit signage elsewhere in the PSPA is unclear.
24. I have not been involved in setting sign luminance limits for HCC, so I cannot comment on the reason for the figure selected. However, in my experience, the actual luminance at night does not typically exceed 150 cd/m². The limits are typically lower for building facades as they do not contain messaging that necessitates greater brightness for legibility and comprehension. The 350cd/m² limit is similar to that required in the Auckland Unitary Plan for digital billboards. The latter being 250cd/m². In my view the 350 cd/m² limit is reasonable.
25. Regarding lit signage elsewhere in the PSPA, this is beyond the scope of matters that HCC have asked me to address. However, reading Chapter 25.10.5.7 it is unclear to me also.
26. In paragraph 12.11, Ms Mander states that the PC5 provisions appended to the Section 42A report are currently lacking: Low-reflectance surfaces, light trespass from windows, shielding from headlamps and flicker.
27. I have addressed these aspects in paragraph 28 f) below. In summary, I am of the view that these aspects have been appropriately considered.

Ms Mander’s conclusions

28. At paragraph 13.2 of her evidence, Ms Mander sets out her recommendations. My response to those are set out below.

- a) **Define lighting for community safety:** These are already addressed on a city-wide basis in Chapter 25.6 Lighting and Glare – Objectives, policies and rules.
- b) **Set illuminance thresholds based on sound evidence:** The primary goal is to keep the SBHA areas dark. By setting a limit of 0.3 lux at the SBHA 20m buffer boundary, added illuminance will drop to an unmeasurable amount (i.e. dark) well inside the 20m buffer. While overseas guidelines such as the ILP Guidance note 08/18² (**GN8**) are not absolutely definitive, they provide helpful advice which has informed the plan change provisions. A copy of the document is included in the evidence of Dr Kerry Borkin for DOC as Appendix C. The diagram at the top of page 12 shows the PC5 situation with Zone A representing the Significant Natural Area (**SNA**) and Zone B the buffer. They recommend a strict illuminance limit in Zone B and suggest on page 22 limits of 0.2 lux horizontal and 0.4 lux vertical. The plan change provisions have simplified this to an average of 0.3 lux in either direction. Hence, the plan change provisions are consistent with the guidance offered in GN8.
- c) **Apply lighting constraints across the PSPA:** The provisions currently do this consistent with GN8 in my view. This is covered in more detail in my evidence and reports. The following summarises the effect of the current plan change provisions:
- I. SNA: No lighting;
 - II. SBHA: No lighting (other than emergency utility maintenance lighting) and 0.3 lux illuminance limit at 20m buffer boundary;
 - III. Property Adjoining the SBHA:

² Guidance Note 08/18 - Bats and artificial lighting in the UK – Institute of Lighting Professionals (ILP) & Bat Conservation Trust

- Lights aimed straight down, no upward light and lights mounted as low as practical
- 2700K (3000K for residential on far side of a road)
- Security lights on a 5 minute timer;

IV. Remainder of the PSPA: HCC city-wide lighting rules apply.

The higher value habitat has greater controls than other areas within the PSPA, consistent with the Amberfield decision, other than road lighting remote from the SBHA (2700K for Amberfield). The value of the latter is negligible in my view as the remainder of development lighting is unconstrained and therefore, applying the constraint purely to road lighting would be of negligible value. The HCC default standard for road lighting is 3000K throughout the city. There is negligible difference between 2700K and 3000K. These are nominal values and in fact, with the standard tolerance permitted³ for each of these figures, a luminaire producing a colour temperature of 2870K could qualify as either 2700K (2725±145) or 3000K (3045±175). There is also very little 'blue light' content difference between 2700K and 3000K. I also note that the IDA have changed their stated preference to a minimum of 3000K for outdoor lighting (previously 2700K)⁴.

- d) **Use 2700K universally:** As noted above there is a valid rationale for using 3000K in some residential areas and for not applying colour temperature controls for developments remote from the SBHA.
- e) **Illuminance meters should read down to 0.01 lux:** I agree. Hence, I propose an amendment to Advisory Note 2 in the proposed

³ SAA/SNZ TS 1158.6 Lighting for roads and public spaces – Part 6: Luminaires – Performance - Table 5.3 – Nominal correlated colour temperature and chromaticity tolerance.

⁴ <https://www.darksky.org/our-work/lighting/lighting-for-citizens/lighting-basics/> [Outdoor Lighting Basics – Color Matters].

amended conditions in my primary evidence. "0.1 lux" should instead read "0.01 lux".

f) **Consider luminous intensity, luminance, low-reflectance surfaces, light trespass from windows, shielding from headlamp & flicker:**

- I. Luminous Intensity: Already addressed. All lights adjacent the SBHA face directly down, so little/no luminous intensity (glare) experienced within the SBHA and SNA.
- II. Luminance: Unlikely to be a significant issue in practice in my opinion. Building façade lighting if present will be adequately constrained by the other rules proposed. Illuminated signage facing the SBHA would likely be minimal. Luminance is considered by GN8 but it proposes no specific constraints.
- III. Low-reflectance surfaces: Unlikely to be a significant issue in practice in my opinion. All lighting adjacent the SBHS will be directed downwards, so any vertical surfaces will typically reflect downward aiming light downwards. Ground surface finishes tend to be mostly low reflectance on average by their nature.
- IV. Window light trespass: Impractical to enforce.
- V. Headlight effects: Not a significant concern in my opinion. Addressed in my primary evidence at paragraphs 34 to 38.
- VI. Flicker: Not a significant concern in my opinion. Addressed in my supplementary lighting report at section 4.2.

CONCLUSION

29. With the proposed amendment noted at paragraph 28 e) above, I am of the view that the current plan change provisions are satisfactory with respect to lighting effects.

John Kinross Mckensey

22 September 2022