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Our Ref: 50175

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National Infrastructure Planning  
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20<sup>th</sup> May 2019

Dear Mr MacDonald

**Nationally Significant Infrastructure Project  
Proposed redevelopment of Manston Airport, Kent  
Examining Authority's Third Written Questions and request for information (ExQ3)**

Thank you for your consultation regarding the above development. Public Health England (PHE) has specifically considered the question Ns3.12:

*Significant Observed Adverse Effect Level (SOAEL) daytime*

*The Examining Authority (ExA) is considering whether it should be a requirement in the draft DCO that the authorised development should have an SOAEL daytime of 60dB  $L_{Aeq,16hr}$  (free field). The Noise Mitigation Plan would be amended appropriately throughout to reflect this revised SOAEL daytime.*

*What are the views of all IPs on this revised SOAEL daytime?*

The term "Significant Observed Adverse Effect Level" (SOAEL) first appeared in the Noise Policy Statement for England (NPSE 2010). This term was created for the purpose of the NPSE by borrowing and "extending" the toxicological concepts of "No Observable Effect Level" (NOEL) and "Lowest Observable Adverse Effect Level" (LOAEL) (NPSE 2.21). The term SOAEL does not feature in the noise and health literature, including WHO publications related to noise.

The WHO Regional Office for Europe applied the concept of LOAEL for their Night Noise Guidelines, published in 2009. It describes its recommendation for a night-time LOAEL in the following terms:

*“The LOAEL of night noise ... can be considered a health-based limit value of the night noise guidelines (NNG) necessary to protect the public, including most of the vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise.”*

This recommendation was informed by an in-depth review of the scientific literature.

The NPSE defines the SOAEL as:

*“the level above which significant adverse effects on health and quality of life occur.”* (NPSE 2.21)

This additional context is then given:

*“2.22 It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”*

Further information about the SOAEL is provided in the Planning Practice Guidance (Noise) (Paragraph: 005 Reference ID: 30-005-20140306)

*“Increasing noise exposure will at some point cause the significant observed adverse effect level boundary to be crossed. Above this level the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is above this level the planning process should be used to avoid this effect occurring, by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused.”*

And:

Perception	Examples of Outcomes	Increasing Effect Level	Action
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, eg avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid

PHE notes there are three aspects to the “examples of outcomes” for a noise level exceeding a SOAEL:

- Noise leading to a behavioural change or a change in attitude
- Noise leading to sleep disturbance
- Noise leading to diminished quality of life due to a change in acoustic character of the area

The second point is not relevant to the question posed by the ExA (daytime noise). On the first point (behavioural change), PHE is not aware of good quality scientific evidence that links specific noise levels to behavioural change in a population. Furthermore, the scientific evidence is clear that reactions to noise at an individual level are strongly confounded by personal, situational and environmental non-acoustic factors [4,5]. This is why large inter-personal variations are observed in the reaction of a population to a particular noise level [6-7].

On the third point, PHE is of the view that the “acoustic character of the area” will be determined by all the sounds that are audible in that area – this includes sounds that are typically appraised negatively by the local population, such as noise from transportation, and sounds that are typically appraised positively by the local population, such as nature sounds in a tranquil park. A transport infrastructure scheme classified as a Nationally Significant Infrastructure Project is likely to emit noise over a large geographical area characterised by varying types of “acoustic character”. This makes it difficult to define a single noise level that has the potential to change the acoustic character of the area. Furthermore, epidemiological studies looking at associations between noise and quality of life focus on the noise exposure outside people’s homes, rather than the acoustic character of the area [8].

For these reasons PHE is not able to provide an evidence-based judgement on whether a SOAEL of 60dB  $L_{Aeq,16hr}$ , or any other level, is appropriate within the context of the wording in the Noise Policy Statement for England and the Planning Practice Guidance Noise.

Should you have any questions or concerns please do not hesitate to contact us.

Yours sincerely

On behalf of Public Health England  
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*Please mark any correspondence for the attention of National Infrastructure Planning Administration.*