

Before the Board of Inquiry
Waterview Connection Project

in the matter of: the Resource Management Act 1991

and

in the matter of: a Board of Inquiry appointed under s 149J of the Resource Management Act 1991 to decide notices of requirement and resource consent applications by the NZ Transport Agency for the Waterview Connection Project

Rebuttal evidence of **Siiri Wilkening (Operational Noise)** on behalf of the **NZ Transport Agency**

Dated: 1 February 2011

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REBUTTAL EVIDENCE OF SIIRI WILKENING ON BEHALF OF THE NZ TRANSPORT AGENCY

INTRODUCTION

- 1 My full name is Siiri Wilkening. I refer the Board of Inquiry to the statement of my qualifications and experience set out in my evidence in chief (*EIC*) (dated November 2010).
- 2 I repeat the confirmation given in that statement that I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court.

PURPOSE OF EVIDENCE

- 3 The purpose of this rebuttal evidence is to respond to certain aspects of the evidence lodged by submitters as it relates to operational noise. Specifically, my evidence will respond to the evidence of:
 - 3.1 Nevil Hegley, Auckland Council (Evidence No. 111-2);
 - 3.2 Andrew Beer, Auckland Council (Evidence No. 111-9);
 - 3.3 Hiltrud Grüger, Springhleigh Residents Association (Evidence No. 43-1);
 - 3.4 Paul Conder, Unitec Institute of Technology (Evidence No. 160-1);
 - 3.5 Poul Israelson, Unitec Institute of Technology (Submission No. 160-2);
 - 3.6 Brett Skeen, Waterview Primary School (Evidence No. 175 and 176-3)
 - 3.7 Brendon Vipond, Vipond Family Trust (Evidence No. 100-1);
 - 3.8 Alex Wardle and Piers Monaghan (Evidence No. 61-1);
 - 3.9 Belinda Chase (Evidence No. 126-1);
 - 3.10 Jinhu Wu (Evidence No. 59-1).
- 4 I have also read the Section 42A Report and Addendum (dated 7 and 20 December, respectively) prepared by Environmental Management Services, and the specific Section 42A Report by Malcolm Hunt on noise and vibration issues. My evidence responds to the operational noise issues set out in those reports.

NEVIL HEGLEY, AUCKLAND COUNCIL (111-2)

- 5 Mr Hegley provided expert evidence on noise issues on behalf of Auckland Council. I note that Mr Hegley did not raise any operational noise issues.
- 6 However, Mr Hegley suggested amended conditions¹ in relation to operational noise mitigation being installed early during construction. I note that the amendments Mr Hegley proposed actually relate to construction and I have therefore addressed them in my Construction Noise Rebuttal.²

ANDREW BEER, AUCKLAND COUNCIL (111-9)

- 7 In his evidence on behalf of the Council on open space issues, Mr Beer comments on noise effects, although I note that he does not record having reviewed my Technical Report G.12 or my EIC.
- 8 Mr Beer states, in relation to noise effects in Sector 9 that “noise generated by the proposal will result in a significant change to the current environment and decrease the quality of open space.”³ I agree that Sector 9, when comparing the existing and future noise situations without and with the Project in place, will be the most affected of all Sectors. However, the proposed open space areas in Sector 9 are still predicted to have noise levels that are generally suitable for active and passive recreation. For instance, the Valonia Street Park is predicted to receive noise levels between 52 and 63 dB $L_{Aeq(24h)}$.⁴ I consider that these noise levels are generally suitable for recreational purposes in an urban environment.

HILTRUD GRÜGER, SPRINGHLEIGH RESIDENTS ASSOCIATION (43-1)

- 9 Ms Gröger of the Springhleigh Residents Association discusses a number of operational noise issues in her submission. I address each of the following issues below:
- 9.1 Cumulative noise effects from the Project and other noise sources;
- 9.2 Appropriateness of noise criteria, alternative criteria and noise effects on Waterview Primary School and Kindergarten;

¹ Hegley Evidence, paragraphs 6.2 and 7.2. I note that Mr Hegley’s amendments were also picked up in the relief sought by Ms Richmond, for the Council, in Annexure A to her evidence.

² Wilkening Rebuttal (Construction Noise), in response to Mr Hegley.

³ Beer Evidence, paragraph 11.23.

⁴ My EIC, Annexure A, Sector 9.

9.3 Noise effects on new park and sports land; and

9.4 Timing of implementation of traffic noise mitigation.

Cumulative noise effects from the Project and other noise sources

- 10 Ms Gröger notes⁵ that my assessment was limited to noise effects from the Project only, i.e. that only traffic and ventilation noise from the State highway formed the basis of my predictions and mitigation design. In her statement, Ms Gröger asserts⁶ that there will be future cumulative noise effects from traffic on local roads, which will increase over time.
- 11 I agree that there will be noise from sources other than the State highway network, and that for some dwellings these noise sources will contribute to the overall noise level. However, since SH20 and SH16 will be major State highways with high traffic volumes, they will be the controlling noise source for most dwellings in their vicinity, especially those within 100 metres from the road. My assessment, undertaken in accordance with NZS6806, focuses on those receivers within a 100 metre band from the road edge and excludes noise from any unrelated sources, such as local roads, industrial and commercial areas or playgrounds/schools.
- 12 The reason for the exclusion of these noise sources is twofold; first, most people contribute to general noise levels in urban and suburban circumstances where they use local roads and playgrounds, and are therefore part of the ambient noise environment. Secondly, mitigation of noise effects is restricted to noise that is being produced by the Project itself. In most instances, mitigation will be implemented within the designation and will therefore be under the control of the NZTA, which enables the construction and maintenance of such mitigation. Attempting to mitigate noise from the multitude of other, unrelated noise sources would not be possible or effective.
- 13 Therefore, I do not agree that my assessment should have included noise effects from sources other than those directly related to the Project.

Appropriateness of noise criteria, alternative criteria and adverse effects on Waterview Primary School and Kindergarten

- 14 Ms Gröger quotes⁷ internal noise criteria for dwellings and classrooms, which are taken from the Guidelines for Community Noise by the World Health Organisation (WHO) 1999 and

⁵ Gröger Evidence, paragraph 16.1.

⁶ Gröger Evidence, paragraph 16.1.

⁷ Gröger Evidence, paragraphs 16.4 to 16.6.

AS/NZS2107:2000 respectively. I have used these criteria in determining appropriate construction noise criteria where I considered it necessary. However, for the assessment of traffic noise, suitable noise criteria are set out in NZS6806:2010.

- 15 I consider the WHO Guidelines to be "ideal" values. In most circumstances, these guidelines are too stringent to be practicable, especially in urban environments. For example, achieving night-time noise levels of 30 dB L_{Aeq} in bedrooms, while desirable, is in many instances not practicable, especially in areas where ambient noise levels are elevated. This is particularly the case where large infrastructure developments are located in the vicinity of dwellings, e.g. highways, rail or airports.
- 16 In relation to noise levels in Sector 9, my predictions show that average daily noise levels will be up to 64 dB L_{Aeq} , with many dwellings receiving lower noise levels. During night-time, based on a normal diurnal variation in traffic volume, this noise level would reduce to approximately 55 dB L_{Aeq} for the most affected dwellings. With windows ajar, the internal noise level would be at most 40 dB and generally lower, depending on the angle and line-of-sight to SH20. With windows closed, internal noise levels would be at and below the WHO Guidelines.
- 17 The 35 dB L_{Aeq} noise criterion for schools noted⁸ in Ms Gröger's statement is on the low end of the range set out in AS/NZS2107:2000.⁹ Waterview Primary School will be virtually unaffected by traffic noise from the Project and will therefore receive similar noise levels to those currently experienced. In addition, upgrades to the school buildings and the provision of alternative ventilation for construction noise control will result in noticeably lower noise levels inside classrooms following construction. I predict that compliance with the 35 dB L_{Aeq} internal noise criterion of AS/NZS2107 can be achieved once the Project is operational.
- 18 Issues relating to Waterview Kindergarten noted in Ms Gröger's statement are, in my opinion, resolved by the proposal to permanently relocate the Kindergarten to a location more distant from the Project. The relocation will result in overall lower noise levels for the Kindergarten than are experienced in its current location.

⁸ Gröger Evidence, paragraph 16.5.

⁹ I note that it is proposed to meet the upper end (45 dB $L_{Aeq(9am\ to\ 3pm)}$) of the AS/NZS2107 guidelines in the teaching areas of Waterview Primary School during construction.

- 19 Overall, while I agree that the WHO Guidelines provide ideal values for internal noise levels in dwellings, I do not consider they are practicable in this instance. I have based my assessment of operational noise on the requirements of NZS6806 and, in my opinion, a suitable outcome for residents and the school will be achieved with the preferred mitigation options proposed.

Noise effects on new park and sports land

- 20 Ms Grüger’s statement discusses the amenity effects of the Project on the two new soccer fields in Hendon Park and suggests that children will be “subjected to unhealthy noise levels”.¹⁰ I assume that this statement refers to the proposed fields in the Valonia Street Park as opposed to the two sports fields north of the southern tunnel portal.¹¹
- 21 The sports fields in Valonia Street Park are predicted to receive noise levels of 55 to 60 dB L_{Aeq} .¹² These noise levels are suitable for active sporting grounds (which are noise generators in themselves). The WHO recommends that noise levels in school playgrounds be in the order of 55 dB L_{Aeq} . No guideline is given for active sports fields.
- 22 In the circumstances of Valonia Street Park, the noise mitigation measures (bunds and barriers) proposed to protect residences in Valonia Street and Methuen Road will also provide effective protection of the proposed sports fields.
- 23 As I have noted above in response to Mr Beer, I consider that the predicted noise levels for the areas in Valonia Street Park that are recommended to be converted to sports fields are suitable for this purpose and will not result in adverse health effects for those using the facilities.

Timing of implementation of traffic noise mitigation

- 24 Ms Grüger seeks¹³ that “all noise mitigation measures ... be implemented before the use of SH20 commences”. I agree with this requirement (with respect to operational noise mitigation measures) and note that condition ON.5 confirms this requirement.

¹⁰ Grüger Evidence, paragraph 16.3.

¹¹ The sports fields north of the southern tunnel portal are predicted to receive noise levels below 50 dB $L_{Aeq(24h)}$ and with the shielding from the tunnel ventilation building which is not included in the noise model, even lower noise levels. These noise levels are well below any noise level which would result in any adverse health effects.

¹² My EIC, Annexure A “Preferred Mitigation Options”, Sector 9.

¹³ Grüger Evidence, paragraph 16.8.

PAUL CONDER, UNITEC INSTITUTE OF TECHNOLOGY (160-1)

- 25 Mr Conder, on behalf of Unitec, requests¹⁴ that the operational noise assessment take account of potential future development of the Unitec site. It is Mr Conder's opinion that a future development of 5 to 10 storeys in height on the north western corner of the site adjacent to the Great North Road Interchange would be a permitted activity under the Concept Plan contained in the Auckland City District Plan Isthmus Section.¹⁵
- 26 I note that NZS6806:2010 states clearly that Protected Premises and Facilities (*PPFs*) include only existing buildings and those buildings that already have building consent.¹⁶ The reason for this limitation is twofold. First, the assessment for a PPF is at the façade. For the façade, and therefore the assessment position, to be reliably identified, a detailed plan needs to be available showing the location of the façade. Secondly, future developments may involve all kinds of activities and structures of unknown dimensions. For instance, the Unitec Structure Plan shows that proposed uses in the area under consideration include non-noise sensitive uses such as shops and commercial activities. These activities are not PPFs under NZS6806.
- 27 I also consider that any future development, including development of the Unitec site, can take account of the existing situation at the time of planning and construction of the development, and incorporate good planning in terms of location, building materials and activities facing existing noise sources.
- 28 Moreover, in the circumstances of this Project, the existing SH16 motorway currently results in high noise levels being received on the Unitec site. The Figures in my assessment in Technical Report G.12, show that the existing noise levels at the Unitec façades are in excess of 65 dB L_{Aeq} .¹⁷

¹⁴ Conder Evidence, paragraph 8.4.

¹⁵ City of Auckland District Plan Isthmus Section – Operative 1999, Appendix B (Planning Maps) D04-10 Concept Plan – Unitec, Area B

¹⁶ Refer NZS6806:2010, Section 1.4.1(g).

¹⁷ Technical Report G.12, Appendix G, Figure G(iii) Existing Layout (2010).

- 29 With the Project in place and the projected increase in traffic volume to the year 2026, and with the implementation of the Preferred Mitigation Option for this area,¹⁸ these noise levels will remain virtually unchanged. This unaltered noise environment results from the proposal to use special low-noise generating road surface material for the entire Great North Road Interchange, including on the existing SH16 in the vicinity of the Interchange.¹⁹
- 30 In addition, I note that the Structure Plan for the Unitec site sets out a building platform. Taking into consideration the position closest to the Project at which buildings could be placed within that building platform and the likely requirement to retain large trees currently on the site, the plans in Appendix G(iii) of Technical Report G.12 confirm that existing noise levels at such a building would remain virtually unchanged from present.
- 31 Therefore, my predictions show that the Unitec site will experience noise levels similar to current noise levels, which in my opinion means that Unitec will not be adversely affected by the Project.

**POUL ISRAELSON, UNITEC INSTITUTE OF TECHNOLOGY
(160-2)**

- 32 Mr Israelson's statement is in support of Mr Conder's statement above and does not raise any further issues. My responses to the issues noted in Mr Israelson's statement are set out in Paragraphs 25 to 31 above.

**BRETT SKEEN, WATERVIEW PRIMARY SCHOOL (175 AND
176-3)**

- 33 Mr Skeen references my EIC regarding the dwellings required to be removed along the Great North Road frontage "which will leave dwellings behind less shielded from traffic on Great North Road".²⁰
- 34 I note that the placement of the tunnel services building adjacent to Waterview Primary School will result in effective shielding of the school from traffic noise from Great North Road, similar to the shielding that would have been provided by the existing dwellings

¹⁸ Technical Report G.12, Appendix G, Figure G(iii) Preferred Mitigation Options (2026).

¹⁹ The use of low-noise generating road surface material for mitigation purposes as opposed to the use of noise barriers results in noise level reductions irrespective of the height of the receiver location. Therefore, any multi-storey development on the Unitec site would receive a benefit from the preferred mitigation option. In response to the Unitec concern I undertook noise level modelling for a height of 30 metres above ground. The modelling showed that noise levels without the Project and with the Project and preferred mitigation option remain virtually unchanged at that height.

²⁰ Skeen Evidence, paragraph 70.

that are proposed to be removed. Additionally, the proposed bund will shield houses across Waterview Park from the Interchange.

BRENDON VIPOND, VIPOND FAMILY TRUST (100-1)

- 35 Mr Vipond seeks that the proposed retaining wall along the northern side of the city-bound Great North Road Interchange off-ramp be extended to provide acoustic shielding for dwellings in Berridge Ave.²¹
- 36 My noise level predictions show that future traffic noise levels from the Great North Road Interchange will remain unchanged with the implementation of the Project, irrespective of the predicted increase in traffic volume up to the design year in 2026.²² The unchanged levels are due to the proposed utilisation of low-noise generating Twin-layer OGPA on the entire Interchange, including SH16 and the new and existing ramps.
- 37 In relation to the extension of the retaining wall suggested by Mr Vipond, I consider that with a barrier height of 2 metres above road level, dwellings in Berridge Ave would receive a small acoustic benefit (in the order of up to 2 decibels for ground floor rooms). Upper storeys would receive virtually no benefit from such a barrier as they would retain acoustic line-of-sight over a 2 metre barrier. In order to provide a noticeable noise level reduction for upper floors of dwellings in Berridge Ave facing the existing Great North Road off-ramp, barriers would need to be at least 4 metres high above the road surface of the ramp. Accordingly, such walls were not considered by the Project team to be the best practicable mitigation option. The preferred mitigation option of the use of Twin-layer OGPA has been determined to be the best practicable option overall as it will benefit all PPFs in the area, irrespective of location in relation to the Interchange.
- 38 Mr Vipond also notes that the removal of foliage and bamboo between SH16 and the residential property at 9 Berridge Ave have had adverse noise effects.²³ I note that vegetation would need to be extremely dense and have a depth of at least 50 metres to provide any noise reduction effect. Generally, road-side vegetation is of lesser density and depth and does not provide any acoustic benefit. However, visual shielding may be perceived to reduce noise levels. In my opinion, removal of vegetation would not have had an actual adverse acoustic effect on dwellings in Berridge Ave.

²¹ Vipond Evidence, paragraph 5(a).

²² Technical Report G.12, Appendix G, Figure G(i) Existing Situation (2010) and (iii) Preferred Mitigation Options (2026).

²³ Vipond Evidence, paragraph 5b.

ALEX WARDLE AND PIERS MONAGHAN (61-1)

- 39 In their statement²⁴, the submitters reference my EIC²⁵ in relation to predicted noise level changes due to the implementation of the Project and draw conclusions, which are inaccurate.
- 40 The submitters state that my EIC “acknowledges [an] increase in noise of 3dB”.²⁶ This conjecture is generalising my assessment and is incorrect in relation to many dwellings in Pt Chevalier. My EIC states that dwellings in Pt Chevalier are predicted to receive noise level increases of “up to 3 decibels”.²⁷ Not every dwelling will receive a noise level increase. Specifically, dwellings in Berridge Ave are predicted to receive noise levels in the design year that are the same or up to 1 decibel louder than currently experienced.²⁸
- 41 The submitters state that “Annex B [of my EIC] clearly places our property within the noise affected area”.²⁹ The figure in Annexure B of my EIC shows a noise level contour map, which I specifically prepared to show the noise effects of the Project on the new Waterview Park. Other areas included in the map, including the submitters’ site, are peripheral to the main issue (noise in Waterview Park) and are not intended to show specific “noise affected areas”. In fact, as Appendix F to my Technical Report demonstrates, noise levels from SH16 are currently 67 dB at the submitters’ site. With the Project and the preferred mitigation option implemented, this noise is predicted to reduce to 66 dB .
- 42 The submitters seek the provision of “sound barrier solutions to our property e.g. double glazing or alternative solution” and that the NZTA “Provide noise barrier screening by way of solid fencing and shielding by trees and shrubbery”.³⁰ I consider that neither mitigation option is suitable or necessary for the submitters’ property. I have predicted that the Project will not result in a noticeable adverse effect on their property. Existing noise levels will be virtually unchanged with and without the Project in place.³¹

²⁴ Wardle and Monaghan Evidence, paragraph 6(d).

²⁵ My EIC, paragraphs 49 to 54.

²⁶ Wardle and Monaghan Evidence, paragraph 6d.

²⁷ My EIC, paragraph 50.

²⁸ Refer Table 6.3 in Section 6.5 of Technical Report G.12. This table shows that noise level changes of less than 3 decibels are not generally noticeable, especially if they occur over a number of years.

²⁹ Wardle and Monaghan Evidence, paragraph 6d.

³⁰ Wardle and Monaghan Evidence, paragraph 8a and b.

³¹ Technical Report G.12, Appendix F(ii) Pt Chevalier, North of SH16.

BELINDA CHASE (126-1)

- 43 Ms Chase seeks the use of curved barriers in Sector 9 and considers that such barriers would result in a further reduction in noise level as they would “reflect ... back into the motorway area”.³²
- 44 The preferred mitigation option in Sector 9 involves barriers of 2 to 2.5 metres north of the motorway alignment and up to 5 metres south of the motorway. The difference in barrier height is due to the land rising south of the motorway, whereby dwellings are elevated above SH20 requiring higher barriers for effective shielding, and the distance to the closest residences. I note that a number of dwellings are proposed to be removed in Hendon Ave, thus increasing the distance from SH20 to some of the nearest dwellings.
- 45 Providing a curved barrier would generally result in a higher effective height of barrier due to the horizontal shift of the top edge of the barrier to an equivalent higher height. I consider that the use of curved barriers for noise mitigation in Sector 9 may result in reduced noise levels for some dwellings, provided the design could incorporate a considerable curve and provide cover for at least half of the motorway lanes.
- 46 However, I understand that there are structural and practicability issues with curved barriers. While these issues are addressed in the rebuttal evidence of Andre Walter, I understand that they result in higher noise barriers than have been determined as the preferred mitigation option.
- 47 Accordingly, based on the input from the Project team in relation to the preferred mitigation option, which takes into consideration the urban design implications and practicality of proposed mitigation measures, I consider that the utilisation of curved barriers does not constitute the best practicable option in accordance with NZS6806.

³² Chase Evidence, paragraph 19.

JINHU WU (59-1)

- 48 Mr Wu is concerned about traffic and ventilation noise effects on dwellings in Hendon Ave, specifically 101 to 105 Hendon Ave.³³ These are the closest houses that will be retained on the southern side of Hendon Ave.
- 49 The effect on these dwellings has been described in both my Technical Report G.12³⁴ and my EIC³⁵. Dwellings in 101 to 105 Hendon Ave will be well shielded from SH20 due to the motorway being in a deep cut (approximately 8 metres below ground).
- 50 I note that these dwellings have been identified as potentially requiring mechanical ventilation³⁶ in order to mitigate night-time construction noise. Such ventilation would enable residents to shut windows and receive even lower internal noise levels once the road is operational.
- 51 I consider that the Project's traffic noise effects on houses at 101 to 105 Hendon Ave will be mitigated to a suitable level.

SECTION 42A REPORT – NOISE & VIBRATION - M HUNT

- 52 Mr Hunt produced a Section 42A report, which discussed noise and vibration issues. I note that Mr Hunt does not identify any issues in relation to operational noise, including traffic and ventilation noise.
- 53 Mr Hunt agrees with my conclusion that "the adoption of NZS6806 [...] will ensure reasonable outcomes for all affected residents in the vicinity of the Project, as well as providing a suitable method of predicting the potential noise effects of the Project on future development in the vicinity."³⁷ In addition, he notes that the "NZS6806:2010 based assessment set out within the Operational Noise AEE report [...] is supported as it is based on the best practicable option approach, which aligns well with RMA requirements."³⁸

³³ Wu Evidence, paragraph 5(a).

³⁴ Technical Report G.12, Section 8.9.2.

³⁵ My EIC, paragraphs 79 and 80.

³⁶ Appendix C of Technical Report G.5: CNVMP Appendix E.

³⁷ Malcolm Hunt Associates Section 42A Report, Section 4.1.

³⁸ Malcolm Hunt Associates Section 42A Report, Section 4.2.

SECTION 42A REPORT – ENVIRONMENTAL MANAGEMENT SERVICES

- 54 Environmental Management Services (*EMS*) has provided a Section 42A Report (dated 7 December 2010) and a Section 42A Addendum report (dated 20 December 2010). I have read both as they pertain to noise. I note that the Section 42A Report and Addendum do not make reference to Mr Hunt's Section 42A Report and do not appear to summarise Mr Hunt's expert opinion in relation to potential noise effects of the Project. The noise issues addressed in the EMS Section 42A Report and Addendum have generally not been noted by the Board's noise expert as an issue of disagreement.
- 55 Three operational noise issues not previously discussed have been raised by EMS in their report to which I respond:
- 55.1 Extension of noise barriers in Parr Road;
- 55.2 Amenity Effects on Alwyn Ave; and
- 55.3 Noise emissions from the ventilation stack.

Noise barrier in Parr Road

- 56 In their Section 42A Report, EMS states that "a review of the nose [sic] barrier layout [in Parr Road] is worthy of further consideration".³⁹
- 57 During the mitigation option evaluation for Sector 6 North, I provided several options⁴⁰ for noise barriers in the vicinity of Parr Road North, varying in height from 2.5 metres to 6 metres. The resulting noise level reductions were small, up to 3 decibels for barriers of considerable height.
- 58 During the option evaluation workshop for Sector 6, the Project team decided that the best practicable option would be to provide building modification mitigation for the most affected dwellings, in this instance 10 and 12 Parr Road North, rather than constructing a substantial barrier. This is the preferred mitigation option put forward in my assessment⁴¹ and EIC.⁴²

³⁹ EMS Section 42A Report, paragraph 10.7.19

⁴⁰ Technical Report G.12, Section 8.61 and Appendix F(iii) North of SH16.

⁴¹ Technical Report G.12, Section 8.6.1.7.

⁴² My EIC, paragraphs 60 and 61.

59 I note that the Board's noise expert Mr Hunt did not identify any operational noise issues and instead, as noted above, commented on the appropriateness of the process used to arrive at the preferred mitigation options.

Amenity effects at Alwyn Ave

60 The EMS Section 42A Report states, in relation to the proposed noise barriers in Alwyn Ave (Sector 1), that "ongoing discussion with land owners is necessary to ensure amenity effects are managed to acceptable levels for residents through the adoption of appropriate mitigation measures."⁴³

61 As this statement is headed "Noise" in the EMS report, I assume it refers to noise levels following the implementation of the Project, including mitigation measures. As noted extensively in my assessment⁴⁴ and EIC⁴⁵, the preferred mitigation options proposed for the Project were developed by the Project team as the best practicable options. This process involved meetings with affected residents, including in Alwyn Ave, in relation to mitigation options.

62 The feedback received from the resident meeting included comments that residents at the end of Alwyn Ave preferred not to have their view blocked by a barrier. This position was considered during the determination of the preferred mitigation option.

Noise limits for mechanical services

63 The EMS report states: "The proposal is that noise from the tunnel services building and ventilation stack will be controlled to meet the District Plan noise limits which are 75 dBA L₁₀ and 85 dBA L₁."⁴⁶

64 It is incorrect that the operational noise associated with the mechanical services is proposed to comply with the District Plan noise limits. The noise limits set out in the EMS Report are also incorrect.

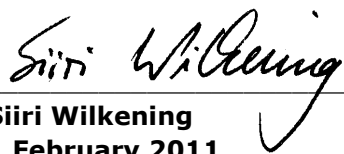
⁴³ EMS Section 42A Report, paragraph 10.2.24

⁴⁴ For example, Technical Report G.12, Sections 4.1.4, 6.3.2 and 8

⁴⁵ For example, my EIC, paragraphs 10, 12, 31 and 32

⁴⁶ EMS Section 42A Report, paragraph 10.8.56.

- 65 In my Technical Report⁴⁷ and EIC⁴⁸ I propose noise criteria for the mechanical services building which are based on the current District Plan noise limits. However, I have updated the noise level descriptor to L_{eq} .⁴⁹
- 66 I propose noise criteria of 50 dB $L_{Aeq(15 \text{ min})}$ daytime and 40 dB $L_{Aeq(15 \text{ min})}$ night-time.⁵⁰ I note that Mr Hunt in his Section 42A Report concurs with my recommendations.⁵¹


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1 February 2011

⁴⁷ Technical Report G.12, Section 4.4.1.

⁴⁸ My EIC, paragraph 40.

⁴⁹ My EIC, paragraph 40 and footnote 8.

⁵⁰ My EIC, paragraph 40 and proposed Condition ON.13.

⁵¹ Hunt Section 42A Report, section 4.4.