BEFORE THE ENVIRONMENT COURT

Decision No. [2015] NZEnvC 70

ENV-2010-WLG-000114

IN THE MATTER	of an application under section 311 of the Resource Management Act 1991
BETWEEN	PALMERSTON NORTH CITY COUNCIL Applicant
AND	NEW ZEALAND WINDFARMS LIMITED Respondent

Court: Environment Judge B P Dwyer
Environment Commissioner D J Bunting
Environment Commissioner A J Sutherland

Heard at: Palmerston North on 29-31 October 2014

Counsel/ Appearances:
J Maassen and N Jessen for the Applicant
M Holm and H Atkins for the Respondent

DECISION

Decision Issued: 21 APR 2015

A: Declaration 1.1 made

B: Declarations 1.2-1.4 declined

C: Costs reserved in favour of Applicant

THE SEAL OF THE ENVIRONMENT COURT OF NEW ZEALAND

Introduction

[1] On 30 August 2011 Palmerston North City Council (the Council) made application for a series of declarations pursuant to s311 Resource Management Act 1991 (RMA) concerning the operation of Te Rere Hau windfarm (TRH) near Palmerston North. The respondent in the proceedings was New Zealand Windfarms Limited (NZWL) the owner and operator of the wind farm.

[2] The Council sought nine declarations numbered 1.1–1.9 in the initial application.

[3] On 4 July 2012 the Court issued a decision in respect of declarations 1.1-1.3, 1.8 and 1.9[1] (the initial decision). The remaining declarations remained *alive.*

[4] The Council has since sought consideration of the remaining issues which have been renumbered 1.1-1.4 in an amended application. We will set out the form of the amended applications as we come to consider them further in this decision.

Background

[5] The background to these proceedings is set out in full in paragraphs [1]-[53] of our initial decision. We do not repeat those details here, but simply adopt the identified paragraphs of our initial decision which should be read in conjunction with this further decision.

[6] The Court heard further evidence regarding the issues in these current proceedings from:

- Ms K M Boardman (a consultant in data analysis, modelling and risk analysis) for NZWL;
- Dr S G Chiles (an acoustician[2]) for NZWL;
- Mr M M Halstead (an acoustics engineer) for NZWL;
- Mr N I Hegley (an acoustics engineer) for NZWL;
- Mr N R Lloyd (an acoustical consultant) for the Council;

[1] Decision No. [2012] NZEnvC 133, (2012) 17 ELRNZ 210.
[2] We have used the various descriptions which each of the acoustic witnesses gave for their professions in their witness statements.

- Mr G Reutersward (an acoustic consultant) for the Council;
- Mr C I Sadler, CEO of NZWL;
- Dr D A Sim (a statistical consultant) for the Council.

We will not endeavour to summarise the evidence of all of these witnesses but will rather refer to relevant portions of their evidence in our consideration of the various declarations which follows.

Declaration 1.1

[7] The Council seeks a declaration in these terms:

That the noise emissions from the respondent's WTGs at the Te Rere Hau wind farm have known special audible characteristics.

[8] In a memorandum from the Council dated 9 February 2015 Mr Reutersward described *special audible characteristics* as being a term often adopted by acousticians to describe sounds with characteristics that make them especially audible. That description reflects our long understanding but will be the subject of further debate later in this decision. Special audible characteristics are commonly referred to as SACs. Noise from wind turbine generators (WTGs) which contains SACs is commonly penalised when undertaking windfarm noise assessments by increasing the measured level of the noise to reflect its annoying characteristics.

[9] Amongst the characteristics which make up SACs are *tones* or *tonality*. Examples of tones include hums and whines from sources such as transformers or gear boxes.

[10] It was common ground between the acoustical witnesses that sound emissions from the WTGs at TRH contain tones. Para 10 of the Joint Statement of the witnesses of 9 September 2011 records:

It is agreed that the spectrum of the sound at 50 metres from the Windflow 500 turbines tested contains tones which would likely trigger the SAC penalty at this distance.

[11] Para 11 of the witnesses' Second Joint Statement records:

It is agreed that tonality is present in the installed turbines when measured and assessed as if the IEC61400 measurement position were a noise sensitive location.[3]

[12] In their joint statements the witnesses differentiated between tones and SACs. In response to a question from the Court, Mr Halstead explained the difference by describing SACs as *penalisable tones*,[4] being tones that attract a penalty of +5dB in accordance with NZS6808:1998[5] (the Standard) when assessing the acceptability of the sound level from a WTG. Similarly, Dr Chiles expressed the view that until a tone crosses a penalty threshold it is not penalisable and therefore not classified as an SAC.[6]

[13] The basis for the witnesses' evidence was that section 5.3.2 of the Standard provided for a penalty to be applied to SACs and the penalty does not become applicable under section 5.3.2 until tones have been assessed under the Joint Nordic Method[7] as having a tonal audibility equal to or greater than 6.5dB. Accordingly tones which do not exceed the threshold are not SACs. We understand the logic of the evidence but observe that the distinction is not one which has previously been advanced in the various wind farm cases which the members of the Court have heard (to the best of our recollections). The distinction appears to be inconsistent with section 5.3.1 of the Standard which defines SACs as *...clearly audible tones, impulses, or modulation of sound levels...* with no reference to thresholds.

[14] It is not necessary for us to accept or reject the distinction made by the witnesses in this case as reports produced by Messrs Halstead[8] and Hegley[9] identified tonal audibility exceeding 6.5dB from a number of WTGs measured in accordance with IEC 61400-11[10]. The maximum tonal audibility of 11dB occurred

---

[3] IEC 61400 is a standard specifying noise measurement techniques for WTGs set by the International Electrotechnical Commission.
[4] NOE, page 137.
[5] NZS6808:1998 was the applicable standard at the date TRH obtained its resource consent. It has now been replaced by NZS6808:2010.
[6] NOE, page 157.
[7] An internationally recognised procedure for assessing the audibility of tones in noise.
[8] Te Rere Hau Noise Compliance, Marshall Day Report, Rp008 R02 2011095W, 17/2/14.
[9] Windflow 500 Turbine, Measurements in General Accordance with IEC 61400-11, Hegley Acoustic Consultants Report No:8580 v1, July 2009.
[10] The reference IEC 61400-11 is a reference to Chapter 11 of that document.

at WTG T015 for the 995.1Hz tone at a wind speed of 9m/s. Mr Reutersward described the tonality levels as being higher than those of any turbine he had worked with.

[15] The tonal measurements had been taken at a distance of approximately 50m from the WTGs as required by IEC 61400-11. We understood all of the acoustic witnesses to agree that based on these measurements the Te Rere Hau WTGs have tonality levels exceeding 6.5dB.

[16] On that basis the WTGs indisputably produce SACs when measured close to the turbines in accordance with IEC 61400-11 and we accordingly make Declaration 1.1 as sought by the Council:

> *That the noise emissions from the Respondent's WTGs at the Te Rere Hau wind farm have known special audible characteristics.*

Declarations 1.2 and 1.3

[17] We will deal with these declarations together as they raise related issues. The Council seeks declarations in these terms:

> ***Declaration 1.2***
>
> *That a penalty of +5 dB is to be applied to the measured sound level (L_R) for the reference sites as measured in MDA report of 18 February 2011 either based on the operating or "operational" or "fully operational" data sets.*

> ***Declaration 1.3***
>
> - *That for the purpose of undertaking an objective test for tonality in accordance with condition 5(1) of the Resource Consent:*
>   - *(a) The assessment technique contained in IEC61400-11 (2002) is to be used; and*
>   - *(b) The assessment technique contained in IEC61400-11 (2002) requires measurements and assessments to be undertaken at locations close to the wind turbine generator.*

[18] Determination of these declarations must be undertaken in context. That context is Condition 5 of NZWL's resource consent which deals with measurement and control of sound levels at TRH together with Condition 5(l) which deals with tonal noise. They provide as follows:

> *5 The sound levels shall be measured and controlled using NZS6808:1998 Acoustics - The Assessment and Measurement of Sound from Wind Turbine Generators but with the following additional requirements to be met.*
>
> > *(l) If noise is judged to be tonal then the tonal correction as contained in NZS6808:1998 shall be applied except the assessment technique is that contained in IEC61400-11(2002) Wind Turbines - Part 11 - Acoustics-Noise Measurement Technique. No correction is to be applied to a measured noise level for the additive affect* (sic) *of the background noise.*

[19] The tonal correction referred to in Condition 5(l) is the imposition of the penalty of +5dB to measured noise levels for the purposes of assessing compliance with WTG sound levels imposed by Condition 4 of the consent.

[20] The central matter in dispute between the parties was the position where Condition 5(l) requires the assessment of tonality to be undertaken for the purposes of imposition of the penalty. NZWL contended that the position was at various reference sites identified in the consent whereas the Council contended that the assessment was to be made at a point approximately 50 metres from the WTGs, being the point at which IEC 61400-11 requires measurements to be made.

[21] The distinction is highly significant for TRH which, as Mr Halstead acknowledged,[11] is *running close* to the noise limits imposed in its consent approximately 20-30% of the time it is operating. If the Council's measuring position close to the WTGs is adopted and the WTGs are measured as producing SACs at that position (as we have found for Declaration 1.1), then a penalty of +5dB is to be added to noise measurements taken at the reference sites even though there may be no penalisable SACs at the sites themselves where NZWL says the SAC assessment should be undertaken. Before examining the elements of difference

[11] NOE, page 140.

between the parties we make a number of general observations about the relevant provisions of the Standard and Condition 5(l).

[22] We note that Condition 5 (generally) and 5(l) (specifically) incorporate the provisions of the Standard relating to the measurement and control of sound levels from WTGs into the resource consent together with some *additional requirements.* We understand that to mean that the relevant provisions of the Standard form part of the conditions of consent in this case, except to the extent that they are in some way varied, added to or overridden by the additional requirements. As we observed in Footnote 5 (above), the Standard has now been replaced as a New Zealand standard however, it remains *alive* for the purposes of interpretation and enforcement of the TRH resource consent which has adopted it for compliance purposes.

[23] The Standard makes a distinction between pre-installation calculation and prediction of wind farm sound levels and post installation compliance testing. The former is dealt with under section 4 of the Standard and the latter under section 5. Section 4.4.3 of the Standard took a precautionary approach to the prediction of wind farm noise from WTGs with known SACs for the purpose of assessing predicted noise effects from the turbines. Noise from these WTGs had a +5dB penalty automatically added to predicted and measured sound levels for assessment purposes. That penalty was not added to the predictions for TRH as it would have been had the presence of SACs been recognised, possibly adding to the significant inaccuracies in the predictions brought about by understatement of the WTGs' sound power levels.

[24] We note that a Marshall Day peer review of the predictions for TRH undertaken before the Council hearing recorded ...*The predicted WTG noise levels have been correctly assessed using the suggested criteria from NZS6808. However, it remains to be confirmed whether the Windflow 500 has any special audible characteristics. A 5 dBA penalty would substantially change the results of the noise assessment.*[12] NZWL's evidence to the Council hearing was that a problem tone with the Windflow WTG had been eliminated so that it possessed no significant

[12] Council decision, Footnote 4.

tones[13] and accordingly no substantial change was made to the pre-installation assessment of noise likely to be generated by TRH.

[25] However we are now dealing with a compliance situation under section 5.3.2 of the Standard (and Condition 5(l) of the consent) which contains quite different provisions to section 4.4.3. We disagree with the Council's argument in these proceedings to the extent that it relied on the provisions of section 4.4.3 and in particular the claim that the +5dB penalty contained in that section applies both pre and post-installation.[14] We do not consider that use of the word *measured* in section 4.4.3 implies that the section continues to be applicable post installation, but rather reflects the fact that the sound level of some WTGs will have been measured and will be known prior to installation whereas in other instances the sound levels will have been predicted.

[26] It is clear that section 4 of the Standard is applicable pre-installation. Section 4.4.3 makes no reference to IEC 61400-11 (which did not exist at the time) nor to IEC DIS 1400-11 (which did) and specifically provides that compliance testing is to be undertaken by reference to section 5.3 of the Standard. Accordingly the outcome of these proceedings revolves around the post-installation and compliance provisions contained in section 5 of the Standard and Condition 5 of the resource consent.

[27] Condition 4 of TRH's resource consent sets maximum sound levels for noise from the WTGs at TRH. Condition 5 goes on to specify how those sound levels are to be measured and controlled for compliance purposes once the wind farm becomes operational. Condition 5(l) is set out in para [18] (above). We make the following observations about it:

- The commencement of the Condition provides that WTG sound levels are to be measured and controlled using the Standard but with *additional requirements*. One of those additional requirements is found in Condition 5(l);
- Condition 5(l) refers to noise being judged to be *tonal* rather than containing SACs. We are not sure of the significance of that in light of

[13] Council decision, para [61].
[14] Closing submissions, paras [41]-[43].

our earlier discussion about the distinction which NZWL's witnesses made between the two;

- Condition 5(l) refers to the *assessment technique* contained in IEC 61400-11. Counsel for NZWL contended that IEC 61400-11 is a method of measurement, not assessment and that was also the agreed position of the acoustic witnesses.[15] That uncertainty may have been resolved by reference to the note in section 5.3.2 of the Standard which reads ...*The objective method for determining whether a sound exhibits a tonal character shall be that used in IEC DIS 1400-11*[16]*for assessing wind turbine tonal character close to the turbine, i.e. The Joint Nordic Method.* However IEC 61400-11 which has replaced IEC DIS 1400-11[17] in Condition 5(l) does not contain any reference to the Joint Nordic Method.

Those observations bring us to the nub of the issue between the parties

[28] The acoustic witnesses (excluding Mr Reutersward who did not participate in witness conferencing) agreed in their two joint statements[18] that for the purposes of compliance testing, tonality is to be measured and assessed at receiving dwellings for the purposes of imposition of any SAC penalty. That was the position advanced by NZWL. Mr Lloyd subsequently sought to resile from that agreement, not for any technical reason but on the basis of discussions with counsel for the Council as to legal issues around the interpretation of Condition 5(l).

[29] We also note that Mr Reutersward testified that compliance testing...*is more typically completed at the receptor location (far field) where the potential impact is perceived*[19] ... which is consistent with the position adopted by the other acoustic witnesses in the joint statements. In the *Recommendation* section of his evidence in chief, Mr Reutersward deviated from that position somewhat, saying ...*Given the clear presence of tones in the near field in this case and as this is effectively a re-application for a planning permit I believe a +5 dB tonality penalty is justified.* Mr

[15] Joint Statement, 9 September 2011, para 21.
[16] A predecessor of IEC 61400-11, hence the amended reference in Condition 5(l).
[17] The distinction between the two is discussed in more detail later in the decision.
[18] Joint Statement, 9 September 2011, para 22 and Second Joint Statement. Para 17.
[19] EiC, para [24].

Reutersward's characterisation of the nature of these proceedings (a re-application for planning permission) was not correct so we disregard his view in this respect, although his evidence re-emphasises the totally unsatisfactory nature of the evidence tendered by NZWL to the initial Council hearing and the extent to which the outcome of that hearing may potentially have been different had correct information been advanced.

[30] The approach adopted by the acoustic witnesses in their joint statements that compliance testing should be undertaken at receptor locations is supported by wider consideration of the Standard. There are a number of reasons for that:

- The Foreword to the Standard states...*This Standard also provides guidance on the limits of acceptability for sound received at residential and noise sensitive locations emitted from both windfarms and single WTGs.*(our emphasis)
- Section 4.5.1 (pre-installation) of the Standard recommends background sound measurement positions at the location of the nearest affected residential property and other representative residential locations. Section 5.2.1 of the Standard adopts those positions for post operational compliance testing;
- Section 5.2.1 of the Standard provides that where practical, sound from WTGs should be measured at the same locations where background sound levels were determined and Condition 5(h) of the TRH consent imposes that as a mandatory requirement. Condition 5(a) of the consent requires background levels to be measured at the notional boundary of various identified dwellings;
- Section 5.3.1 of the Standard refers to ...*adverse community response*... to SACs indicating that it is the response of recipients which is under consideration.

We think that it is abundantly clear that as a general proposition the Standard is directed at addressing the effects of WTG noise on recipients of the noise and that sound measurements are to be taken at receptor locations.

[31] The evidence which we heard established that although there might be SACs present at a measuring point near a WTG, characteristics such as tonality will change, weaken and possibly disappear as the sound propagates from its source due to factors such as distance and topography. In tests which he undertook on WTGs T96, T103 and T104 Mr Hegley found that there were no tones at a distance of 675m from the turbines notwithstanding that there were tones close to them. The presence of SACs in the near field is no guarantee that they will be experienced in the far field. Accordingly, having measurement and assessment points at the same receptor location is a logical approach. It was the approach advocated in this instance by NZWL and agreed to at a practical level by all of the acoustic witnesses. However, that approach is thrown into confusion by the provisions of both the Standard and Condition 5(l), more particularly the requirement in Condition 5(l) that if tonal noise is present then a correction is to be made using the assessment technique in IEC 61400-11. The issue in this case is not about common practice, but rather the interpretation of Condition 5(l). A condition may depart from common practice for any number of reasons.

[32] Firstly, in this regard, we refer to the provisions of section 5.3.2 of the Standard which provides that ...*When sound has a special audible characteristic, the measured sound level of the source shall have a 5 dB penalty applied.* Section 5.3.2 goes on to provide that the method for determining whether sound has a tonal character is that contained in IEC DIS 1400-11 i.e the Joint Nordic Method. We note that section 5.3.2 does not refer to IEC DIS 1400-11 itself as a method of determination, rather it adopts the Joint Nordic Method contained in IEC DIS 1400-11. As we observed earlier (Footnote 7) the Joint Nordic Method is an internationally recognised procedure for assessing the audibility of tones in noise.

[33] Secondly, we refer to Condition 5(l) which provides that ...*the assessment technique* (for tonal correction) *is that contained in IEC 61400-11*...rather than IEC DIS 1400-11 as provided in section 5.3.2 of the Standard (and we will return to the differences between those documents further).

[34] There was no dispute between the parties that IEC 61400-11 requires measurement close to WTGs (as we understand, so did IEC DIS 1400-11). Part 11 of that document commences with this statement:

> ***Scope***
>
> *This part of IEC 61400 presents measurement procedures that enable noise emissions of a wind turbine to be characterised. This involves using measurement methods appropriate to noise emission assessment at locations close to the machine, in order to avoid errors due to sound propagation, but far enough away to allow for the finite source size.*

[35] We make the following observations about IEC 61400-11:

- We understand that the appropriate measuring point, calculated as a function of rotor diameter and hub height, is approximately 50m from the WTGs;
- IEC 61400-11 refers to its measurement methods as being *...appropriate to noise emission assessment...* so that use of the term assessment in Condition 5(l) is not inappropriate or inaccurate;
- The reason why the measuring point is close to the WTGs is *...to avoid errors due to sound propagation...* yet it is the effects of sound propagation which determine how sound from the WTGs will impact on those who receive it. While such an approach might be suitable for pre-installation predictions of WTG sound effects, its use for compliance testing appears questionable.

[36] We consider that there is an inconsistency between the broad approach of the Standard which is directed at addressing the effects of WTG noise at receiver locations in the far field and section 5.3.2 (referring to IEC DIS 1400-11) and Condition 5(l) incorporating IEC 61400-11, when that document requires a near field process. Dr Chiles acknowledged the uncertainties in the Standard and advised that the 2010 revision of NZS6808 (of which he was the Chairperson) had resolved any debate as to the point of assessment by requiring measurement at identified receptor

locations.[20] We note that NZS6808:2010 has substantively different provisions to the 1998 Standard.

[37] The Council contended that the plain reading of Condition 5(l) was that once SACs were identified in the operation of WTGs by near field measurement in accordance with IEC 61400-11 (as we determined that they have been-Declaration 1.1) then the +5dB penalty applies automatically to all noise measurements across the windfarm. We agree that such an outcome is an apparent consequence of including reference to IEC 61400-11 in the Condition but that outcome is inconsistent with the provisions of the Standard which also forms part of Condition 5 and which contemplates receptor measurements for compliance purposes. (We note that it is also inconsistent with Conditions 5 (a) and (h) of the consent.)

[38] In the case of Condition 5(l) the inconsistency is compounded by a significant difference between IEC 61400-11 which was included in Condition 5(l) and IEC DIS 1400-11 which appeared in the Standard.

[39] We have been unable to find any material in the initial commissioner's decision on the TRH application which assists us as to what was intended by inclusion of the reference to IEC 61400-11 in Condition 5(l). NZWL has not called its acoustic witness before the Council (Mr M Hunt) as a witness in these proceedings to assist us in that regard. There is nothing in Mr Hunt's evidence to the commissioner's hearing which assists us in interpreting the condition although he specifically urged inclusion of the reference to IEC 61400-11 in his evidence to the commissioner.[21] Ultimately we have to interpret the condition on its face in any event.

[40] We refer again to the relevant provisions of:

- The first sentence of the Note to Clause 5.3.2 of NZS6808:1998 which states that:

[20] EiC, paras 10 and 11.
[21] Hunt evidence to commissioner, para 2.16.

The objective method for determining whether a sound exhibits a tonal character shall be that used in IEC DIS 1400-11 for assessing wind turbine tonal character close to the turbine, ie The Joint Nordic Method.

- Condition 5 (l) which states that:
  If noise is judged to be tonal then the tonal correction as contained in NZS6808:1998 shall be applied except the assessment technique is that contained in IEC 61400-11 (2002) Wind Turbines – Part 11 – Acoustics – Noise Measurement Technique. No correction is to be applied to a measured noise level for the additive affect [sic] of the background noise.

It is apparent that Condition 5(l) deliberately sets out to replace the reference in the Standard to IEC DIS 1400-11 with a reference to IEC 61400-11. It may possibly be the case that Mr Hunt's intention was simply to have the condition refer to the most up to date version of the document. However, IEC 61400-11 does not contain reference to use of the Joint Nordic Method which was included in IEC DIS 1400-11.

[41] Mr Halstead advised that IEC DIS 1400-11 (being the current document when the Standard was introduced in 1998) was the precursor to IEC 61400-11 (which is dated 2002). He said that IEC DIS 1400-11 and the Joint Nordic Method contained frequency analysis methods common to them both. He agreed that while the Joint Nordic Method contained a penalty threshold, IEC 61400-11 does not.[22]

[42] Condition 5(l) provides (in summary) that if a noise is judged to be tonal, the tonal correction to be made is that set out in the Standard but with IEC 61400-11 replacing IEC DIS 1400-11. What is unclear is the status of the Joint Nordic Method under the Condition. If IEC 61400-11 is to replace IEC DIS 1400-11 does it also replace the use of the Joint Nordic Method contained in IEC DIS 1400-11 and if so, (given that IEC 61400-11 does not contain a penalty threshold) what is the penalty threshold to be?

[43] The acoustic witnesses joint statement of 9 September 2011 addressed this uncertainty as follows:

[22] NOE, pages 103 and 104.

Reference to this standard [IEC 61400] in condition 5(l) was intended to replace the reference in the note to 5.3.2 of NZS 6808:1998 where the draft version of the standard was cited (IEC DIS 1400-11) and this had been overtaken by the full 2002 version. This note states that the draft standard used the Joint Nordic Method to assess tonality but no reference to a tonality assessment is made in the 2002 version of IEC 61400-11.[23]

[44] The joint statement went on to provide that:

Mr Lloyd now accepts that because IEC 61400-11 does not set out an objective assessment technique as condition 5(l) assumes then this overtakes the ambiguity about where the tones should be measured for the assessment procedure and therefore the objective measurement and assessment technique should revert back to NZS6809:1998 i.e using the Joint Nordic Method.[24]

[45] In short, the acoustic witnesses sought to fill the *ambiguity* in Condition 5(l) brought about due to the replacement of IEC DIS 1400-11 in the Standard by IEC 61400-11 in the condition. They undertook an assessment of the tonal characteristics experienced by receptors in the far field using the Joint Nordic Method (more specifically JNM1) which led them to the view that there were no penalisable tones at the assessment positions.

[46] While the experts' adoption of the Joint Nordic Method might be seen as being pragmatic and convenient, the need for them to do so highlights the underlying inconsistency and uncertainty in the wording of condition 5(l) as to what the penalty regime should be and where and how it should be assessed. We appreciate the reasons why the acoustic witnesses have adopted the practical approach that they have to interpretation of the Standard and the Condition, but we agree with the Council that ultimately that interpretation is a legal matter.

[47] Condition 5(l) lies at the heart of the compliance provisions of the TRH consent. It is of immense significance in the case of TRH where the WTGs are known to emit SACs in the near field and where tones are discernible at receptor

[23] Joint Statement, 9 September 2011, para 21.
[24] Joint Statement, 9 September 2011, para 22.

locations (albeit not at levels which attract a penalty if assessed at those locations[25]). The Condition has two significant shortcomings which we have described above:

- An inconsistency between the provisions of the Standard which have been incorporated into the condition and contemplate an assessment of noise effects on far field receptors, and the inclusion of a near field measurement mechanism (IEC 61400-11) in the condition;
- Uncertainty as to the applicable assessment method and penalty threshold due to the fact that IEC 61400-11 does not address these issues.

[48] We appreciate that arguments can be (and have been) made either way as to interpretation of Condition 5(l). The arguments between counsel as to interpretation of the condition were reflected in vigorous debate between members of the Court as to its interpretation and reflect the uncertainties in the condition.

[49] We have considered whether we have power to or should sever reference to IEC 61400-11 from the condition. We consider that even if we have power to do so that would be inappropriate in light of its deliberate inclusion. The fact is that the condition contains the conflicting and uncertain provisions which it does.

[50] In *Ferguson v Far North District Council*[26] the Court found that *...a condition requires specificity, clarity and accuracy of expression leading to certain measure of certainty, before it can be enforceable.* In our view Condition 5(l) lacks the required measure of certainty and is incapable of application for enforcement purposes.

[51] Accordingly we decline Declarations 1.2 and 1.3 as ultimately they both rest on determination of the issues we have addressed above.

Declaration 1.4

[52] The Council seeks a declaration in these terms:

[25] We record that we are satisfied with the extent and accuracy of the measurements taken in that regard.
[26] [1999] NZRMA 238, at 244.

That the respondent is not (even without a special audible characteristic penalty) complying with noise limits of its resource consent in the following wind directions and at the following wind speeds:

Site	Wind Direction	Wind Speed Meters per second (m/s)
Site 1 (Moody)	ESE	7-8 m/s
Site 6 (Linforth)	SSE	9 m/s
Site 6 (Linforth)	SSE	10 m/s
Site 7 (Stewart)	NNW	10 m/s
Site 7 (Stewart)	NNW	11 m/s
Site 7 (Stewart)	ESE	6 m/s

[53] The MDA Report[27] presents measurements for the operational and fully operating conditions in three sets of tables and graphs. The 2011 results are first presented followed by the 2012-2013 results and finally the aggregated results in which all measurements are presented. The Report defined a wind farm as *operational* when at least 95% of the turbines are available for power generation but may not necessarily, by virtue of wind conditions across the farm, be operating. Fully operating was defined as when at least 80% of the turbines are in operation as are at least nine of the ten turbines closest to the measuring point.

[54] We found this declaration ill defined in that the particular wind farm condition (*operating* or *fully operational*) is not stated nor is it stated whether it is the 2011, the 2013 or the aggregated results that are to be considered. Following exchanges between the court and Mr Lloyd in which particular pages in the MDA report were discussed[28] we understand it is the *Aggregated Measurement Results March 2011 - 2013* that are to be considered. They appear in Section 8.3 of the MDA Report.

[55] For each of the representative sites results are shown graphically and in tabular form for each of the four critical wind directions (WNW, NNW, SSE and ESE) for both the operational and fully operating cases. The plots show the upper

[27] Te Rere Hau Noise Compliance, Marshall Day Report, Rp008 R02 2011095W, 17/2/14.
[28] NOE, pages 37 – 40.

bound prescribed by Condition 4 of the consent and the best fit regression line through the data. The equation of this line is given.

[56] The tabulation shows for integer wind speeds from 6 to 15 m/s values for the background noise level, the measured noise level, the noise limit and the turbine noise level. The background noise was measured with the wind farm completely shut down. The turbine noise level is derived by logarithmically subtracting the background noise level from the measured noise level.

[57] In considering the declaration sought we must determine what *complying with* implies. Condition 4 requires for compliance that WTG sound levels shall not exceed the best fit regression curve to the background sound levels plus 5dB or 40dB, whichever is greater. This suggests it is the WTG noise level that must be compared with the background noise level.

[58] Mr Sadler was firm in his view that this was the correct approach[29].

[59] Ms Boardman produced Exhibit 2 (Analysis) in which she set out the method of analysis she used in determining compliance. This was not challenged. This analysis also involved subtracting, logarithmically, the background noise level from the operational noise level as measured. This is consistent with NZS6808:1998 which notes[30] *...it may be necessary to adjust these measurements to determine the "windfarm only" levels.*

[60] We now turn to the individual cases cited in the declaration.

- Site 1 Moody-ESE condition[31]. The operational case shows compliance. The fully operating case shows the turbine noise level to be 43dB at a wind speed of 8m/s with a noise limit of 42dB.
- Site 6 Linforth-SSE condition[32]. Both cases show compliance at a wind speed of 9m/s. We note here NZS6808:1998 states[33] that for compliance

---

29 NOE, page 79.
30 NZS 6808:1998, page 17.
31 MDA Report, page 88.
32 MDA Report, page 103.
33 NZS6808:1998, para 4.4.2.

the noise limit should not be exceeded and thus a wind farm noise level equal to the limit complies

- Site 6 Linforth-SSE condition[34]. Both cases show compliance at a wind speed of 10m/s.
- Site 7 Stewart-NNW condition.[35] Both cases show compliance at a wind speed of 10m/s.
- Site 7 Stewart-NNW condition.[36] Both cases show compliance at a wind speed of 11m/s.
- Site 7 Stewart-ESE condition.[37] Both sites show compliance at a wind speed of 6m/s.

[61] The only apparent non compliance is at Site 1 for the fully operational case. We say *apparent non compliance* in view of Ms Boardman's observation[38] that since the data from the fully operating case is a subset of the measured data the background sound levels against which it is to be compared should be a corresponding subset. Intuitively she felt the background sound levels would be raised if the subset corresponding to the fully operational case was used. Having not done the exercise, she could not say this with certainty. We are thus likewise uncertain but we do accept the concept of comparing like with like.

[62] Our finding is the declaration is not confirmed for five of the listed instances and there is uncertainty in the sixth case. The uncertainty is sufficient for us not to make a declaration in that instance.

Outcome

[63] The determination that we have reached is to make Declaration 1.1 and to decline Declarations 1.2-1.4 for the reasons we have set out in the preceding provisions of this decision.

---

[34] MDA Report, page 103.
[35] MDA Report, page 106.
[36] MDA Report page 106.
[37] MDA Report page 108.
[38] NOE page 166.

Comment

[64] In paras [109]-[132] of our initial decision we found that the Council was entitled to conduct a review of the conditions of the TRH resource consent for reasons pertaining to the inaccuracies in the AEE provided by NZWL in support of its application. Those findings of the initial decision stand and in our view are expanded by the findings which we have made in this further decision.

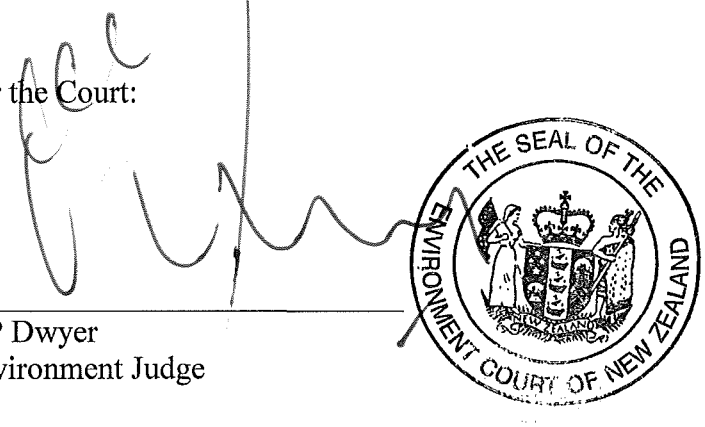
[65] The irony of the situation where the Court has found there to be significant uncertainties in Condition 5(l) will not escape the participants in these proceedings. The insertion of reference to IEC 61400-11 into the condition was promoted by Mr Hunt, NZWL's acoustic witness at the Council hearing. We have already found[39] that there is a need to review Condition 5(l) and the findings which we have made in this further decision reinforce that conclusion.

Costs

[66] Costs on these proceedings are reserved in favour of the Council. Any costs application shall be made and responded to in accordance with para 6.6(f) of the Environment Court's Practice Note 2014.

DATED at WELLINGTON this 21st day of April 2015

For the Court:



B P Dwyer
Environment Judge

[39] Initial decision, para [130].