

**Before the Hearings Commissioners
At Palmerston North**

In the matter of the Resource Management Act 1991

And

In the matter of an application by NZ Windfarms Limited for landuse, stormwater discharge and contaminants discharge consents required to establish the proposed Te Rere Hau Eastern Extension

Between **NZ Windfarms Limited**

Applicant

And **Horizons Regional Council**

And **Tararua District Council**

Consent Authorities

And **Submitters on the application**

Submitters

Statement of Evidence of Philip Jeremy Peet

Introduction

Qualifications and experience

1. My full name is Philip Jeremy Peet. I have a Bachelor's Degree with Honours in Civil Engineering from the University of Canterbury, Christchurch, New Zealand and am a Professional Member of the Institution of Professional Engineers New Zealand (MIPENZ). I am a Chartered Professional Engineer (CPEng) with over eight years experience in traffic and road safety engineering both in New Zealand and in the United Kingdom. I am currently the Transportation Planning and Traffic Engineering Team Leader for MWH New Zealand Ltd in Wellington.

2. For the purposes of this hearing, I have been asked by NZ Windfarms Ltd (NZWL) to provide traffic and roading evidence for the hearing in respect of an application to extend the existing Te Rere Hau Windfarm (TRHE) in Tararua.

Scope of evidence

3. My evidence addresses the traffic related aspects of the TRHE proposal, namely;
 - (i) Traffic generation;
 - (ii) Traffic safety;
 - (iii) Parking and manoeuvring; and
 - (iv) Site access.

4. My evidence also discusses the traffic related issues raised in the submissions received and the planners report.

Summary of conclusions

5. In my opinion the traffic related effects of the TRHE would be no more than minor.

Background and Existing Situation

6. The proposed TRHE is located on North Range Road approximately 2km north of its intersection with Pahiatua Aokautere Road (Pahiatua Track), south east of Palmerston North. Although the proposed turbines will be located within Tararua District Council's (TDC) administrative boundary, the vehicular route to the site from State Highway (SH) 57 is via Pahiatua Track and North Range Road, both of which are the responsibility of Palmerston North City Council (PNCC).
7. The status of a particular road is generally classified according to a roading hierarchy. The hierarchy defines the functional role of each road within the road network. The roading hierarchy in the PNCC's District Plan (District Plan) classifies roads in the following decreasing hierarchical order of importance (excluding parking streets and pedestrian streets):
 - (i) Arterial;
 - (ii) Principal;
 - (iii) Collector; and
 - (iv) Local.
8. Pahiatua Track is classified as a 'Principal' road, while North Range Road is classified as a 'Local' road.
9. Pahiatua Track is a major link between the Manawatu and Wairarapa and provides an important alternative link to State Highway 3 when the Manawatu Gorge is closed. Pahiatua Track carries approximately 1,800 vehicles per day with the peak traffic flow of 230 vehicles per hour occurring in evening peak, which is around 5pm. The proportion of heavy vehicles in the traffic flow is approximately 8%.
10. North Range Road is a narrow unsealed local road, which predominantly serves rural properties and windfarms. It is popular for mountain biking and four-wheel driving during weekends; although these volumes of recreational traffic are comparatively low and typically occur at different times of the week to windfarm traffic.

Crash History

11. A detailed search has been undertaken of the New Zealand Transport Agency's (NZTA's) Crash Analysis System to determine the number, location and types of crashes that have been reported in the vicinity of the site. The purpose of reviewing the historic crash records is to identify any existing crash trends that might be exacerbated by the TRHE.
12. No crashes were reported on North Range Road between the TRHE site and Pahiatua Track in the ten year period 1999 - 2008. Further examination revealed that one crash occurred on North Range Road in July 2009; this involved a motorcycle and a 4-wheel drive vehicle colliding around a blind corner. This crash occurred on a Sunday and was unrelated to windfarm construction traffic.
13. No crashes were reported at the intersection of North Range Road and Pahiatua Track in the ten year period 1999 – 2008 or in 2009 to date.
14. A total of 42 crashes were reported on the 8.7km length of Pahiatua Track between North Range Road and SH57 in the five year period 2004 – 2008. The most common movement associated with these crashes is loss of control on bends. No crashes involving pedestrians or cyclists were recorded during this period. Three crashes involving trucks were recorded, but as far as I am aware, none of these were associated with the current windfarm. A total of five crashes have been reported on this length of road to date in 2009, with none of these involving pedestrians, cyclists or trucks.
15. From my analysis I conclude that there are no crash trends that would be exacerbated by the proposed extension to the windfarm.

Proposed Roading Layout

16. The existing consented windfarm allows for the construction and operation of up to 97 turbines on the western side of North Range Road. Stages 1 (5 turbines), 2 (28 turbines) and 3 (32 turbines) have been completed..
17. The proposed extension consists of 56 turbines located on the eastern side of North Range Road.

18. The primary access for the consented windfarm would be the primary access for the windfarm extension. Sight distance to the south is good; however visibility to the north is restricted by a curve in North Range Road. Given that this access has been used by construction traffic since commencement of the Te Rere Hau consented works, and there have been no reported issues in the operation, I consider that the intersection does not require modification for the proposed extension. I will discuss this further later in my evidence.
19. There is an existing farm access with stockyards opposite the primary access to the existing site that would be upgraded to provide the primary access for 27 of the proposed turbines. This access would be downgraded to a secondary access once construction is complete. My preliminary investigation indicates sight distances are greater than 80m, which exceeds the minimum sight distance recommended in RTS6 'Guideline for Visibility at Driveways' for an operating speed of 65 km/h. I consider the sight distance to be sufficient; particularly given North Ridge Road has a temporary posted speed limit of 30 km/h.
20. I note that the detailed construction of the crossing places would need to comply with Council requirements, which would include consideration of width, surface, gradient and alignment.
21. I will not discuss the internal roading layout for the site as this will not be public road. Nevertheless, all roads will be constructed to allow adequate access for delivery and construction vehicles. Furthermore, space will be provided around each turbine for the parking of 3 to 4 vehicles.

Traffic Generation

22. While the construction of the proposed windfarm extension will create additional trips, it is important to note that there will not be an increase in the number of trips per day compared to the existing situation. This is because the current level of activity in constructing and commissioning the consented windfarm is proposed to continue for TRHE. This means that the traffic effects of the proposal are the same as those that have been experienced during the construction of the consented windfarm to date.

Construction Traffic

23. Construction of the extension is expected to occur over two years. Each turbine would require a total of 11 construction trucks to visit the site, which are listed as follows:
- (i) 1 truck transports two nacelles (i.e. ½ truck per turbine);
 - (ii) 1 truck transports four blades (i.e. ½ truck per turbine);
 - (iii) 1 truck transports two tower tops (i.e. ½ truck per turbine);
 - (iv) 1 truck transports each transformer;
 - (v) 1 truck transports one tower base;
 - (vi) 6 standard concrete trucks to construct the foundation;
 - (vii) 1 additional sundry truck.
24. In addition, up to 20 trucks per day would be required for road metal (between approximately 1170 to 2870 total trips). After the road metalling, the most intense turbine commissioning activity would be the pouring of the foundation; where up to 6 truck trips could be expected in a single day.
25. The volume of light vehicle traffic would depend on the specific programme and intensity of construction adopted by the contractor. At this stage the following gives the best indication of likely traffic volumes. The number of workers on site is expected to peak at 40 people. The overall trips expected can therefore be estimated as follows:
- (i) Average/Typical Traffic: 5-10 trucks per day; 6-20 light vehicles per day;
 - (ii) Peak/Busiest Traffic: 30 trucks per day; 40 light vehicles per day.

Over-dimensional and Over-weight Loads

26. The components are transported to the windfarm from various locations as follows:
- (i) Towers from Lower Hutt and/or Napier
 - (ii) Blades from Auckland
 - (iii) Nacelles from Christchurch
27. In addition there will be two cranes used during the construction of the windfarm:

- (i) A 55 tonne crane, which will generally remain on site during construction
 - (ii) An 80 tonne crane, which will be on site for 1 day every 2 weeks.
28. None of the trucks or cranes would be over-weight or over-width, although the trucks which transport the blades and towers would be designated as over-dimensional loads as they are over-length. The necessary permits will be obtained for all required movements. The trucks, cranes and routes proposed are the same as those currently used on the existing Te Rere Hau windfarm.

Normal/Operational Traffic

29. The windfarm, if fully developed, would have 153 turbines (97 consented plus 56 proposed). There will be approximately 4 fulltime staff on site post construction. The service vehicles visiting the site are likely to be standard 4-wheel drive vehicles, although a small 2-tonne truck is to be used for servicing the hydraulics. The volume of traffic is expected to be approximately 12 to 16 trips per day.
30. Regular maintenance would be scheduled on a three-monthly basis. Traffic during the three-monthly maintenance checks is expected to increase to 18 to 28 trips per day over a three to four week period. This is a low volume of traffic and people visiting the site are likely to become familiar with and better handle the road environment.
31. NZWL does not plan to operate any sightseeing operations. A small amount of sightseeing traffic may stop at the gravelled area at the intersection of North Range Road and Pahiatua Track, or travel up North Range Road to get a closer view of the turbines. It is expected that this would be an insignificant amount of traffic, typically travelling in the less busy weekend times, and would not have a significant impact on the safety or efficiency of the road network.

Traffic Safety

North Range Road

32. As discussed earlier, North Range Road is a narrow unsealed local road with a low speed environment. As part of the consented windfarm, the curves on North Range Road were eased to accommodate articulated trucks with a 14m long semi-trailer. The works improved the forward sight distance (visibility) around these curves.
33. The TRHE proposal would result in the current level of construction traffic continuing for a further 2 years. The road environment is such that it requires drivers travelling the road to exercise caution. Traffic on the road tends to travel at low speeds and this would continue in the construction period and should mean that North Range Road continues to operate in a safe manner.
34. As part of the already consented windfarm, NZWL prepared a traffic management plan (TMP) and installed a number of new and temporary signs on North Range Road; including curve warning signs, construction traffic warning signs and 30km/h temporary speed limit signs. NZWL also operates a 'Large Vehicle Operator's Procedure', which requires drivers of all large vehicles to comply with the following policies on North Range Road:
- (i) Adhere to a maximum speed of 30km/h;
 - (ii) Drive with hazard or warning lights on;
 - (iii) Keep to the left;
 - (iv) Wear high visibility clothing;
 - (v) Check with Site Security before driving onto North Range Road; and
 - (vi) Check with Site Security when entering or leaving the site.
35. The last two requirements ensure that heavy vehicles do not meet head on along North Range Road.
36. NZWL will continue all current procedures for the proposed windfarm and I understand that they are happy to discuss any further requirements with PNCC officers.
37. NZWL has increased maintenance of the road during construction of the consented windfarm and intends to continue this for the extension.

38. I therefore conclude that North Range Road is adequate in terms of its construction and geometry for the low traffic volumes that are existing and proposed.

Intersection of North Range Road and Pahiatua Track

39. The North Range Road intersection is located at the summit of the Pahiatua Track, on the outside of a curve that is posted with a 25km/h advisory speed sign. From some limited speed surveys, I estimate that the operating speed of traffic is between 45 and 55km/h.
40. The shape and size of the intersection is adequate to allow for the ingress and egress of all vehicles on North Range Road. The intersection has seal widening to accommodate left turn entry into North Range Road and a wide unsealed area where North Range Road meets Pahiatua Track.
41. The sight distance toward Palmerston North exceeds 250m, which is more than adequate. The sight distance toward Pahiatua is limited to 50 - 60 m.
42. The sight distance for traffic turning right into the access is not considered significant to this application as construction traffic would be approaching the site from the Palmerston North side. Movements to and from North Range Road would therefore be left turn in and right turn out.
43. The critical movement is therefore the right turn out of North Range Road. Austroads Guide to Traffic Engineering Practice – Part 5: Intersections at Grade, states that the Approach Sight Distance for a road with an approach speed to 50km/h and a reaction time of 2.0 seconds, is 47m. This is also confirmed by NZTA's (formerly Land Transport Safety Authority's) RTS6 Guidelines for Visibility at Driveways which states that the minimum sight distance for a low volume driveway (less than 200vpd) onto a Collector Road with an operating speed of 50km/h is 45m. The current situation meets both these criteria.
44. Accordingly, while the sight distance is relatively restricted, the need for mitigation should be considered in relation to the extent of the activity. There

are two distinct periods of development for the windfarm, the construction period and the normal operation once construction is complete.

45. The traffic volumes are so low once construction is complete (slightly more than that of a farm or single dwelling) that no mitigation measures are considered warranted.
46. The construction phase of the project would result in a higher volume of traffic (30-70 movements per day) for a significant period of time (two years). However, this is consistent with what has been occurring on-site during the construction of the consented windfarm, which has been without incident.
47. As part of the consented windfarm, the road surface on North Range Road was improved by sealing some distance back from its intersection with Pahiatua Track. This sealed portion allows trucks and vehicles to accelerate and decelerate from the side road without losing traction. The improvements have also resulted in a slight improvement to the sight distance as there is now a point on North Range Road approaching Pahiatua Track where visibility toward Pahiatua is improved.
48. While the sight distance is only slightly better than the minimum requirements, the crash history review identified no reported crashes at this intersection in the last 10 years. With construction of the consented windfarm already well in progress, any potential crash issues should have been identifiable from the database. In addition, the operational speed on Pahiatua Track at this intersection is low, (the curve through the intersection is posted at 25km/h) so any potential conflict as a result of limited sight distance is likely to be minor.
49. NZWL does not propose any additional improvements for this intersection as part of the proposed extension, although the existing traffic management and signage would continue.

Pahiatua Track

50. A number of submissions raised the narrow width of the Pahiatua Track and its use by recreational cyclists.

51. The width of Pahiatua Track is approximately 6.5 – 7m with typically 3.1m wide lanes. This width is appropriate for this classification of road in the rolling, and sometimes mountainous, environment. Indeed it is understood that it is the terrain which attracts the recreational cyclists to this route.
52. It is acknowledged that collisions between heavy vehicles and cyclists can result in serious injuries and the narrow road width means that there can be little space for manoeuvring. However, the traffic associated with the windfarm would occur during the week, while recreational cyclists typically use this route during weekends and public holidays; therefore the potential for conflict between these parties is greatly reduced. This is reflected by the crash history which shows no cyclist crashes have been reported on Pahiatua Track between North Range Road and SH57 during the last 5 years.
53. The additional traffic associated with the windfarm will not significantly increase the overall traffic volumes on Pahiatua Track; the windfarm traffic would be less than 4% of the total traffic on this route.
54. I therefore conclude that as the windfarm traffic would not significantly increase the traffic volumes on Pahiatua Track and as the construction of the consented windfarm has occurred without incident, the impact of the proposed windfarm extension on Pahiatua Track would be no more than minor.

Submissions

55. Eleven of the submissions received in relation to the proposal commented on possible traffic related impacts of the TRHE. Ten of these were from neighbours of the current windfarm and one was from PNCC.
56. The issues raised by PNCC in relation to traffic effects were:
 - (i) Sight distance at the intersection of North Range Road and Pahiatua Track. I discussed this issue in paragraphs 39 to 49 of this evidence;
 - (ii) Adoption of a TMP. I discussed the current TMP and the measures that are proposed to continue in paragraphs 34 to 36 of this evidence;
 - (iii) Maintenance of North Range Road. I discussed NZWL's intention to continue maintenance in paragraph 37 of this evidence.

57. The traffic issue raised by the neighbours of the windfarm was in relation to adverse safety impacts of additional traffic on Pahiatua Track. This issue was discussed in paragraphs 50 to 55 of this evidence.

Planners Report

58. The TDC Planners Report, and specifically the Evaluation of Roading Issues Report contained within Appendix D of the Planners Report, discusses the concerns of submitters and TDC. It goes on to make recommendations in terms of two issues:

- (i) Sight distance at the intersection of North Range Road and Pahiatua Track. As mentioned previously, all heavy vehicles entering the site will do so from the Palmerston North side. For these movements, I believe that the current sight distance is adequate.
- (ii) Traffic patterns during times when SH3 Manawatu Gorge is closed. The report recommends that consideration be given to restricting the heavy and over-dimensional traffic accessing the windfarm construction site at these times. While I believe that Pahiatua Track can adequately handle the additional traffic, there could be benefit in preventing vehicles turning right into the site at times of high traffic volumes and therefore I agree that further discussion should be undertaken between NZWL, TDC and PNCC in relation to this issue.

59. The Horizons Regional Council Planner Report does not comment on traffic or roading issues.

Conclusions

60. In, conclusion I consider that:
- (i) Once constructed, the TRHE would only generate a small amount of traffic, slightly more than a typical dwelling;
 - (ii) Construction of the extension would result in a continuation of the existing level of traffic (associated with the consented works) for another 2 years;
 - (iii) The internal roading layout and the accesses onto North Range Road would operate safely and efficiently;

- (iv) With the continuation of the NZWL maintenance regime, TMP and Large Vehicle Operator's Procedure, North Range Road will continue to operate safely and efficiently;
- (v) While the sight distance to the east at the intersection of North Range Road and Pahiatua Track is less than required, the low speeds at this location and the absence of any crashes to date means that no additional improvement works should be required; and
- (vi) The traffic generated will not have a noticeable impact on the safety or efficiency of Pahiatua Track. However NZWL, TDC and PNCC should discuss possible options in relation to restricting heavy and over-dimensional windfarm construction traffic during times where SH3 Manawatu Gorge is closed.

Overall, I consider the traffic related effects of this proposal to be no more than minor.

Philip Jeremy Peet

1 October 2009