



MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Managing Construction Noise at Equestrian Receptors Technical Note



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Contents

1 **MANAGING CONSTRUCTION NOISE AT EQUESTRIAN RECEPTORS TECHNICAL NOTE1**

 1.1 Introduction.....1

 1.2 Review of research, guidance and assessment approaches1

 1.3 Outline approach to mitigating construction noise and vibration impacts at equestrian
 receptors4

 1.4 Conclusion.....8

2 **REFERENCES9**

Glossary

Term	Meaning
Decibel	A unit used to measure or compare the intensity of a sound by comparing it with a given reference level on a logarithmic scale
Noise	An unwanted or unexpected sound.
Onshore Order Limits	Onshore Order Limits See Transmission Assets Order Limits: Onshore (below).
Sound	Fluctuations of pressure within a medium (gas, solid or fluid) within the audible range of loudness and frequencies with excite the sensation of hearing.
Transmission Assets	The area within which all components of the Transmission Assets will be located, including areas required on a temporary basis during construction and/or decommissioning.
Transmission Assets Order Limits	<p>The area within which all components of the Transmission Assets landward of Mean High-Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds).</p> <p>Also referred to in this report as the Onshore Order Limits, for ease of reading.</p>

Acronyms

Acronym	Meaning
BHS	British Horse Society
ES	Environmental Statement
NSR	Noise Sensitive Receptor

1 Managing Construction Noise at Equestrian Receptors Technical Note

1.1 Introduction

- 1.1.1.1 The Examining Authority's Second Round of Questions issued on 8th September 2025 (PD-011) requested that the Applicants provide further information of how the impacts of construction noise on wildlife, livestock (cattle and sheep) and horses have been assessed and what specific measures are going to be implemented to mitigate the impact on animals during construction (Q2.14.1.5).
- 1.1.1.2 Livestock were not identified as receptors sensitive to construction noise and vibration at the pre-application or scoping stage and therefore impacts on these were not assessed or reported in the ES. The Applicants refer to their response to REP3-101.8 (REP4-094), which includes reference to available research on noise and livestock, how this relates to construction noise levels limits proposed for the Transmission Assets and the range of mitigation measures which may be considered to reduce noise impacts on both livestock and horses.
- 1.1.1.3 In its response (REP5-130), the Applicants confirmed that construction noise impacts had been assessed at both Wrea Green Equitation Centre and Quaker Wood Stables, and these are reported in APP-117. However, the Applicants also noted that, further to this assessment and issues raised with regard to potential impacts on horses and protected characteristics of users of the equestrian facilities in submissions to the Examination, it had commenced a study to identify the risk of noise impacts on equestrian receptors which will be used to inform specific noise mitigation at these receptors during construction. The Applicants committed to submit the outcome of the study at Deadline 6.
- 1.1.1.4 This technical note provides the findings of this study which includes a review of equestrian receptors at the businesses for which concerns have been raised. The technical note also sets out the scope of specific mitigation measures which should be considered at these receptors to minimise noise impacts on equestrian receptors during the construction phase.
- 1.1.1.5 Although the focus of this technical note is on construction noise, the Applicants have also given consideration to the impact of construction vibration on equestrian receptors, setting out further measures which can be applied to minimise these impacts.

1.2 Review of research, guidance and assessment approaches

- 1.2.1.1 As noted in paragraph 8.11.4.10 of Volume 3, Chapter 8: Noise and Vibration (APP-117), the Applicants acknowledge that horses can be startled and flee from noises, with reference to guidance published by the British Horse Society (BHS, 2025). This guidance was used to inform the assessment of impacts on Wrea Green Equitation Centre and Quaker Wood Stables, the latter which were identified as locations where horse riding would be undertaken during the daytime as a recreational activity.

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- 1.2.1.2 However, in response to the issues which have been raised during Examination, the Applicants have undertaken a wider review of available research and guidance relating to noise impacts on horses, with a particular focus on construction noise, as well as reviewing assessment approaches undertaken to support other Development Consent Orders and major infrastructure schemes.

Research review

- 1.2.1.3 The Applicants have identified no research studies specific to the response of horses to construction noise. However, when reviewing wider research undertaken on horses' reaction to different sounds, the Applicants have found that several research studies concur with the British Horse Society (BHS) guidance, in that noise can lead to behavioural responses in horses (Christense et al., 2005), particularly where the noise is novel and unfamiliar (Janicka et al., 2022). Research also indicates that different horses, like humans, have different sensitivities to noise and therefore, when considering mitigating the impact of construction noise on equestrian receptors, a receptor specific approach is required.
- 1.2.1.4 When considering the risk of construction noise impact on equestrian receptors from individual construction activities and how this should be mitigated, understanding the hearing range of horses is an important factor. Research has identified that a horse's hearing can range from 55 Hz to 33.3 kHz, with a region of best sensitivity from 1kHz to 16 kHz (Heffner and Heffner, 1983). In comparison, the frequency range audible to humans is typically from 20 Hz to 20 kHz.

Guidance review

- 1.2.1.5 In addition to the guidance used to inform the assessment of equestrian receptors reported in APP-117, the Applicants have identified further guidance published by British Horse Society relevant to the impact of noise on horses from construction activities. In its specific guidance relating to construction (BHS, 2024), the British Horse Society reiterate that it is a horse's instinct to run from threat, with '*sudden noise and movement*' being likely triggers to a horse's reaction. In construction terms, it relates this to sudden movement or noises from machinery being more of a threat to those which are still.
- 1.2.1.6 The guidance also provides specific advice on how such reactions from horses can be managed by contractors, based on the following distances from construction activities:
- 20 metres:
Machinery or activity should not resume until horses are at least twenty metres past. If it is not possible for activity to be halted, staff should be at the location to warn approaching equestrians as appropriate. Such 'sentries' should be obvious on approach, not hidden behind a tree or equipment as suddenly appearing could be an additional stress factor causing a horse to react.
 - 50 metres:

If a horse appears distressed—freezes, jerks sideways, prances about, takes flight, spins round or shies away or acts in any way other than a calm forward motion—or an equestrian appears to be struggling for control, or shouts, all movement and noise should cease immediately to avoid escalating the situation. Activity should not resume unless the equestrian indicates that it is safe to do so or is out of sight or more than fifty metres away.

Approaches taken to assessing impacts in EIA

Approach taken in assessment reported in APP-117

- 1.2.1.7 In its assessment reported in APP-117, the Applicants identified noise sensitive receptors in accordance with the criteria set in Table 8.15, the latter defining their sensitivity according to different settings where human receptors may be present. The assessment methodology and receptor sensitivity are matters which have been agreed with Fylde Borough Council (AS-089, FBC.NV.8) and South Ribble Borough Council (REP4-080, SRBC.NV.8).
- 1.2.1.8 Both Wrea Green Equitation Centre and Quaker Wood Stables were identified as commercial receptors in accordance with guidance in Table 8.15, with a corresponding sensitivity to noise identified as 'low'. However, following further consideration of the particular sensitivity of horses to sound, noting that any noises may be considered as a potential threat from which horses flee, the sensitivity of those using these locations for horse riding as a recreational activity receptor was increased to medium.
- 1.2.1.9 However, the Applicants acknowledge that protected characteristic individuals using the equestrian receptors may, like horses, react differently to sound, including sudden and unfamiliar sounds arising from construction. Therefore, the Applicants' focus during the post-consent phase will be to further understand these specific receptors, including their users, and identify what receptor specific mitigation is appropriate to minimise impacts. This approach is further discussed in **paragraph 1.3.1.13** below.
- 1.2.1.10 The Applicants acknowledge that Midgeland Riding School is also a commercial receptor in accordance with the criteria set in Table 8.15. However, the building associated with the riding school is approximately 650m from the Order Limits and therefore lies outside the construction noise assessment study area of 300m from the Order Limits. Therefore, construction noise impacts at this receptor were not reported in APP-117.

Other DCOs and other major infrastructure projects

- 1.2.1.11 In its review, the Applicants have not identified any other EIA assessments submitted to support DCOs or other major infrastructure projects in which the noise impacts on horses have been considered in the original application documents. The Applicants have identified that the consideration of noise impacts on horses to invariably be in response to matters raised during examination of the developer's applications, the most notable of these being 'High Speed 2 Limited Phase One Noise effects on Livestock' (Arup, 2017) study.

1.2.1.12 This study focussed on the effects resulting from transportation noise effects during the operational phase of High Speed 2 (HS2), noting the following in relation to managing construction noise impacts on livestock, including horses:

‘A number of protective measures are identified in the HS2 Phase One Environment Statement to control construction noise and vibration, including the requirement that best practicable means (BPM) will be applied during construction works to minimise noise (including vibration) at neighbouring residential properties and other sensitive receptors. Additional site-specific mitigation may be also identified in the local environmental management plans.’

1.2.1.13 Although the HS2 Phase One study referred to the application of BPM to minimise construction noise at properties and other sensitive receptors, it acknowledged that site specific mitigation may also be identified to minimise impacts on livestock receptors and such measures to be included in management plans.

Construction vibration

1.2.1.14 The focus of this study is on construction noise, however, the Applicants acknowledge that there is the potential for horses to react to vibration resulting from the construction of the Transmission Assets. Although the Applicants have not identified any specific research studies on this issue, the Institute for Environmental Research and Education (IERE, 2025) suggest that evidence is emerging which indicates horses can:

- Detect subtle seismic activity, such as small earthquakes.
- Respond to vibrations caused by approaching vehicles or machinery.
- Differentiate between different types of vibrations.

1.2.1.15 Therefore, the Applicants have also considered how vibration from construction sources can be managed so that the reaction of horses to it, and the consequential impact on equestrian receptors, can be minimised.

1.3 Outline approach to mitigating construction noise and vibration impacts at equestrian receptors

1.3.1.1 The study has confirmed that equestrian receptors are at risk of impacts due to sudden noises and vibration generated by the construction of the Transmission Assets.

1.3.1.2 The Applicants recognise the need to consider how horses will react to the construction works in close proximity to these receptors and identify what mitigation measures will need to be applied to minimise the risk of adverse noise and vibration impacts at them.

1.3.1.3 However, the Applicants also recognise that the approach to mitigation will need to be developed on a receptor specific basis, as this will vary depending on the specific construction activities (construction plant, timing, duration), the location and use of each equestrian receptor, and the sensitivities of the particular horses. Therefore, engagement with these receptors throughout the post-consent and construction phases will be key to identifying measures

which will be most effective at reducing the risk of adverse noise and vibration impacts at the time the works are undertaken.

- 1.3.1.4 The scope of mitigation measures and engagement to be considered by the Applicants, including reference to existing project commitments, are set out in further detail below.

Scope of mitigation measures

- 1.3.1.5 In its update to the Outline Construction Noise and Vibration Management Plan (oCNVMP) at Deadline 5 (REP5-054), the Applicants committed to give specific consideration to the control of noise at the following equestrian receptors, including the need for any receptor specific measures:
- Wrea Green Equitation Centre
 - Quaker Wood Stables
 - Midgeland Riding School
- 1.3.1.6 The oCNVMP sets out a number of measures which will be considered to minimise construction noise throughout the construction period. These include the use of plant fitted with measures to reduce the noise emitted from them, the shutting down of plant when not in use and the use of site hoardings/temporary noise barriers, including at temporary construction compounds.
- 1.3.1.7 The Applicants note that the measures already included within the oCNVMP will contribute to minimising construction noise and vibration impacts at equestrian receptors. However, the Applicants consider that further specific measures may need to be considered to minimise the impacts at these and other equestrian receptors identified in this study, with a particular focus on minimising the impact of sudden noise events. Such activities which may give rise to such events include but are not limited to:
- setting up and decommissioning of temporary construction compounds (Wrea Green and Quaker Wood Stables);
 - deliveries to operational construction compounds (Wrea Green and Quaker Wood Stables);
 - installation of sheet piling to support trenchless techniques entry and exit pits (potential for all receptors);
 - drilling associated with trenchless techniques (potential for all receptors); and
 - reversing alarms on vehicles (all receptors).
- 1.3.1.8 In these circumstances, additional measures are available to control the impact of such events, which include the following:
- timing such activities, as far as reasonably practicable, to days and times when horses not likely to be near them, or arrangements can be made to remove horses from land while activities are being undertaken;
 - handling deliveries and materials in a manner which minimises noise and vibration;

- selection of low vibration equipment or operate equipment in low vibration modes where practicable;
- consider if non vibratory methods can be used for compacting haul roads and backfill material;
- consider enhancing sound insulation measures to any affected internal facilities; and
- applying BHS guidance to shut down machinery or stop movement and noise, as far as reasonably practicable, where horses are within 20 m / 50 m of construction activities. The application of any measures set out in this guidance will be informed by the bespoke Communications Plan between the equestrian receptor and their appointed Agricultural Liaison Officer (ALO) and Principal Contractor.

Engagement with affected receptors

- 1.3.1.9 As noted in **paragraph 1.3.1.3**, the Applicants recognise the key role that engagement with affected equestrian receptors will have in identifying measures which will be most effective at reducing the risk of adverse noise impacts at a particular location.
- 1.3.1.10 The Applicants are already committed to engagement with various receptors across the Projects, which include those equestrian receptors identified in this study as likely to be at risk of construction noise and vibration impacts. The relevant commitments are as follows.

Outline Code of Construction Practice (oCOCp) (REP5-044)

- 1.3.1.11 The Applicants are committed to appointing an Agricultural Liaison Officer (ALO), who will be the dedicated point of contact for ongoing engagement about practical matters with landowners, occupiers and their agents during the pre-construction and construction phases.
- 1.3.1.12 The scope of works included in the ALO role include arranging meetings with landowners, occupiers or their agents to minimise disruption where possible to existing farming regimes and timings of activities. Such meetings will provide the opportunity for these equestrian receptors to discuss planned construction activities with the potential to trigger horses and identify appropriate noise and vibration mitigation measures to minimise/avoid such events.

CoT79: Outline Construction Noise and Vibration Management Plan (oCNVMP) (REP5-054)

- 1.3.1.13 In the update to the oCNVMP submitted at Deadline 5, the Applicants committed to engage with specific sensitive receptors during the detailed design stage to further understand their use and identify any receptor specific noise and vibration limits and any potential mitigation measures required to minimise construction noise and vibration impacts. These included the following equestrian receptors:
- Quaker Wood Stables,
 - Wrea Green Equitation Centre

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- Midgeland Riding School

CoT35: Outline Communications Plan

- 1.3.1.14 As noted in ISH4, the Applicants have engaged regularly with Wrea Green Equitation Centre in respect of the Transmission Assets. Engagement has focused on the necessary communication and the potential impacts to the sensitivity of the horses. The concerns raised by this receptor include noise and vibration, as well as communication and potential visual and odour disturbance on the horses.
- 1.3.1.15 The Applicants have updated the Outline Communications Plan at Deadline 6 (J1.1/F05) to include a commitment to continuing this engagement through a bespoke communications plan for Wrea Green, which will be prepared in consultation with the Centre. A draft of the bespoke communications plan was shared with Wrea Green on 17th October 2025. The Applicants note the suggested amendments made by Wrea Green and an updated draft will be shared before the close of examination. .
- 1.3.1.16 The aim of the bespoke plan is to outline a dedicated communications plan for all stages of the Transmission Assets, including survey and construction, which will need to be in place throughout the Transmission Asset's presence near Wrea Green. The bespoke plan will be regularly reviewed and updated in consultation with Wrea Green, as appropriate. The objective of the Communications Plan is to provide tailored information to parties which may require more detail due to the nature of their operations. The purpose of the communications plan is to provide more detail to include (but not limited to):

Information provision / gathering

- Provision by the Applicants of a list of potential activities, including schedules of deliveries and activities (via the detailed Construction Traffic Management Plan) to discuss the context of Wrea Green Equitation Centre's current operation and mitigations that can be applied (i.e. timing and location of classes and works).

Engagement.

- Regular check-in calls prior to and during any works in the vicinity (in addition to any general project updates);
- Prior information and details about the works taking place in the vicinity of Wrea Green Equitation Centre (including agreement on what constitutes in the vicinity);
- Proposed start dates and durations of works;
- The agricultural liaison officer's contact details; and
- The contractor's details and landowner liaison contact.

Mitigations

- Bespoke mitigations to be employed, relating to the key areas of concern for Wrea Green Equitation Centre including, but not limited to:
 - Layout of the temporary construction compound to minimise potential odour and visual impacts;

- Appropriate fencing and screening; and
- Measures to minimise noise and vibration impacts associated with the setup, use and decommissioning of the temporary construction compound.
- Regular review (during check-in calls) of the efficacy of mitigation measures, including the protocols contained within the Wrea Green Communications Plan, to ensure measures can be amended as appropriate.

1.3.1.17 In addition, the Project has committed to provision of an equine veterinarian or other suitable specialist to support Wrea Green Equitation Centre by advising on potential additional mitigation measures during the construction phase. This will take into account the activities carried out during the pre-construction period and ensure expert input is available to understand the horses' behaviour and advice on measures that, alongside the Applicants' mitigation, can be taken to help them to acclimatise to any changes in their environment.

1.4 Conclusion

1.4.1.1 The Examining Authority's Second Round of Questions issued on 8th September 2025 (PD-011) requested that the Applicants provide further information of how the impact of construction noise on wildlife, livestock (cattle and sheep) and horses have been assessed and what specific measures are going to be implemented to mitigate the impact on animals during construction (Q2.14.1.5).

1.4.1.2 Livestock were not identified as receptors sensitive to construction noise and vibration at the pre-application or scoping stage and therefore impacts on these were not assessed or reported in the ES. The Applicants refer to their response to REP3-101.8 (REP4-094), which includes reference to available research on noise and livestock, how this relates to construction noise levels limits proposed for the Transmission Assets and the range of mitigation measures which may be considered to reduce noise impacts on both livestock and horses.

1.4.1.3 In its response (REP5-130), the Applicants confirmed that construction noise impacts had been assessed at both Wrea Green Equitation Centre and Quaker Wood Stables and these are reported in APP-117. However, the Applicants also noted that, further to this assessment and issues raised on horses in submissions to the Examination, it had commenced a study to identify the risk of noise impacts on equestrian receptors which will be used to inform specific noise mitigation at these receptors during construction. The Applicants have also considered the impact of construction vibration on horses.

1.4.1.4 Within this study, reported in this technical note, the Applicants have:

- reviewed available research and guidance which have reaffirmed its understanding that sudden noises can trigger horses to respond and therefore risk adverse impacts at equestrian receptors;
- identified approaches to mitigating impacts, referring to current commitments to managing construction noise within the oCNVMP and

potential additional measures to be considered on a receptor basis to control the impact of sudden noises and construction vibration; and

- identified the key role engagement with the affected equestrian receptors throughout the pre-construction and construction phases, referring to its current engagement commitments.

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