

AQMAU reference: AQMAU-C2101-RP01

Project title: Northacre Renewable Energy Facility

Permit reference: EA/EPR/CP3803LV/A001

Date requested: 06/10/2020

AQMAU response date: 01/02/2021

AQMAU recommendation	Conditions/Noted
<ul style="list-style-type: none"> AQMAU considers that the conclusions in the consultant's noise impact assessment report can be used for permit determination. 	<ul style="list-style-type: none"> The consultant has not modelled the HGVs accurately, which underestimates the overall impact at nearby receptors. Additionally, the consultant's CadnaA computer model has used configuration settings which underestimate the impact at nearby receptors. The consultant has not completed a BS4142 assessment for weekend operational hours. The weekend is subject to lower background sound levels than during the week, so is a more sensitive period. The consultant has not taken into account the worst-case scenario. Nevertheless, we agree that the proposed site operations will result in a low risk impact at the nearest residential receptors.
<ul style="list-style-type: none"> The mitigation measures within Section 7.6.3 of the consultant's report must be implemented in full. 	<ul style="list-style-type: none"> AQMAU's conclusions assume that the mitigation measures within Section 7.6.3 of the consultant's report are implemented in full.

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1. Summary of work request

- 1.1 The National Permitting Service (NPS) Waste Team in Warrington asked the Air Quality Modelling and Assessment Unit (AQMAU) to audit a noise impact assessment¹ (NIA) submitted by Axis on behalf of Northacre Renewable Energy Ltd (the applicant) by Axis. The NIA was submitted as part of an Environmental Statement, with the specific Chapter related to Noise and Vibration (Chapter 7) prepared by Noise & Vibration Consultants Ltd (NVC). The assessment is in support of a new permit application for the proposed energy from waste site on Northacre Trading Estate, Stephenson Road, Westbury, BA13 4WD.

2. Conclusions that lead to AQMAU recommendations

- 2.1 The consultant has predicted that the worst case impact will be during the daytime at “Crosslands / Brookfield” on Brook Lane where the rating sound level will be equal to the background sound level. Considering the context of the specific sound levels in relation to the existing sound climate, the consultant states that *“this location [is] likely to be influenced by road traffic, and other existing industrial activities”*. The consultant therefore concludes that the site will be low risk.
- 2.2 The consultant has modelled the HGV movements at a height of 0.5 m above local ground level, with a speed of 25 km/h. AQMAU does not accept that this accurately describes the HGV noise source, as the height is not sufficient and the vehicles are moving too fast compared to what we would expect for a site of this nature. This underestimates the specific sound levels, and therefore the overall impact at the nearest residential receptors.
- 2.3 The consultant has not included a separate BS4142 assessment during the weekend. The background sound levels show that the background sound levels on weekends are lower than during the week. Therefore the consultant has not taken into account the worst case scenario, where the greatest impact will occur at the nearest residential receptors.
- 2.4 In their computer noise modelling, the consultant has assumed one order of reflection and a ground absorption of 0.5 (mixed ground). This configuration does not adequately take into account sound from reflections and overestimates the ground absorption, which we consider to be less than 0.5. This in turn underestimates specific sound levels.
- 2.5 AQMAU has predicted slightly higher sound pressure levels at the receptors than the consultant. However, AQMAU still agrees with the consultant’s conclusions that the proposed site is low risk in terms of the impact from noise pollution.
- 2.6 The consultant has included mitigation measures within their computer noise model - these measures are listed in section 7.6.3 of their NIA report. AQMAU’s conclusions are based on the assumption that all mitigation measures within section 7.6.3 are implemented in full.

¹ 2778-01 / Northacre Facility, Environmental Statement Main Report Volume 1, Chapter 7, August 2020

3. Evidence for AQMAU conclusions

- 3.1 The proposed site is located on the edge of Westbury, in Wiltshire, with pockets of residential uses surrounding the site to the north, east and south. The site is part of a fairly large industrial park. The nearest residential receptors are on Brook Lane, located around 130 m to the north-east of the site.
- 3.2 The Northacre facility is proposed to treat circa 243,000 tonnes per annum (tpa) of residual waste. This waste will be imported to the site in HGVs. A significant proportion of material (52,000 tpa) will be directly transferred by conveyor from the adjacent (existing) Northacre Resource Recovery Centre (RRC) to the newly proposed Northacre facility.
- 3.3 The consultant has used CadnaA noise modelling software to predict the specific sound levels at the nearby residential properties. The consultant has taken into account the following external sound sources:
- HGVs delivering waste (9 per hour),
 - Air cooled condenser fans (6 fans in total),
 - Boiler roof vents,
 - Transformer.
- A number of noise emitting buildings have also been included:
- Bunker,
 - Furnace & boiler room,
 - Tipping hall,
 - Flue gas,
 - Turbine hall.
- 3.4 The site is proposed to be operational for 24 hours a day, 7 days a week. However the conveyor is only proposed to be operational during the daytime hours (07:00 – 23:00). HGVs are proposed to be operational from 07:00 – 22:00 during the weekdays (Monday to Friday) and 07:00 – 17:00 on Saturdays. There will be no deliveries on Sundays.
- 3.5 The Consultant has modelled the HGVs at a height of 0.5 m above local ground level, with a speed of 25 km/h. We consider this height to be unrepresentative of real-world conditions, and would expect the speed to be lower, based on sites of a similar nature. Modelling HGVs at a low height and a faster speed than required means that the HGV specific sound levels are underestimated. AQMAU has conducted sensitivity with the HGVs modelled at a height of 1.5 m and a speed of 15 km/h.
- 3.6 The consultant has not carried out a BS4142 assessment during the weekend. An analysis of the background sound levels shows that the weekend background sound levels are lower than the weekday values. Therefore, the worst case scenario has not been considered. AQMAU has conducted a BS4142 assessment during the weekend.

- 3.7 The consultant has only taken into account 1 order of reflection and has modelled ground absorption coefficient throughout the model as 0.5 (mixed ground). To ensure accuracy of the noise modelling software output, we would expect a higher order of reflection to be used. We also consider the ground within the vicinity of the site to be more reflective than 0.5. These modelling assumptions underestimate the contribution of reflected sound and overestimate the degree of ground absorption. AQMAU has carried out sensitivity checks with higher orders of reflection and variable values (which are lower than 0.5) for the ground absorption coefficient depending on the ground type.
- 3.8 When considering acoustic feature corrections (AFCs), the consultant has stated that “*HGV movements on-site ... are unlikely to be distinctive at NSRs during daytime periods (due to the influence of local road traffic movements along the local road network)*”. However, the consultant goes on to state that the HGVs on site could be “*fitted with a `beeper’ tonal reversing alarm, which may be just perceptible at these NSRs*”. The consultant therefore adds a 2 dB(A) correction at those receptors with line of sight to the Tipping Hall. AQMAU has also considered corrections from the conveyor and air cooled condensers in our sensitivity modelling.
- 3.9 The consultant states that the worst case impact will be during the daytime at Crosslands / Brookfield, where the rating sound level is predicted to be equal to the background sound level.
- 3.10 Considering the specific sound levels in the context of the existing sound climate at the residential receptors, the consultant states that the worst affected locations “*are likely to be influenced by road traffic, and other existing industrial activities.*”
- 3.11 In conclusion the consultant states “*The operational noise impacts from the facility are ... considered to represent a **neutral** level of effect, and not significant.*” This is not specifically a determination of impact in accordance with BS4142, but is taken to mean that a low impact will occur at the residential receptors as a result of the proposed site operations.

AQMAU Check Modelling

AQMAU has carried out sensitivity modelling using CadnaA v2020 based on the sound source levels and data contained in the assessment and the consultant’s calculations. CadnaA uses the ISO 9613-2² calculation methodology to predict the propagation of sound outdoors.

- 3.12 During our sensitivity modelling the following aspects of the model were interrogated:
- Increased the height of the HGV vehicles (to 1.5 m) and decreased the speed (to 15 km/h), see paragraph 3.5.

² ISO 9613-2: 1996. Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

- Modelled 3 orders of reflection (see paragraph 3.7).
 - Modelled the ground absorption depending on the ground type where hard ground = 0 and open fields =1 (see paragraph 3.7).
- 3.13 Following these checks, AQMAU has predicted slightly higher specific levels than the consultant.
- 3.14 AQMAU has considered the acoustic feature corrections (AFCs) proposed by the consultant. The HGVs and conveyor are the dominant sound sources at the Crosslands / Brookfield (the worst affected receptors), which are located to the north west of the site. AQMAU predicts that the residual (L_{Aeq}) sound levels from other existing external sound sources will be 7 dB(A) or more above the specific sound levels of the HGVs or conveyor. Hence, AQMAU deems that it is unlikely that these sources will be perceptible against the existing soundscape, most of the time. Therefore, AQMAU agrees with the consultant's allocation of acoustic feature corrections.
- 3.15 AQMAU agrees with the consultant that the worst affected location is the Crosslands / Brookfield receptor, to the north west of the site. Our sensitivity modelling shows that the rating sound levels are likely to be 2 dB(A) above the background sound levels during the late evening period on the weekdays (Monday to Friday). During the weekend, the rating sound levels are likely to be 3 dB(A) and 2 dB(A) above the background sound levels during the late evening and early morning periods respectively.
- 3.16 The consultant considers that the existing soundscape within the vicinity of the site and at the nearest residential receptors is already characterised by several existing sound sources (see paragraph 3.9). It should also be noted that the site is proposed to be operational 24 hours, 7 days a week, during more sensitive times. AQMAU therefore considers that the context is neutral in this case.
- 3.17 Considering the operational sound levels in the context of the existing sound climate, the specific sound levels from site operations will be lower than the residual L_{Aeq} from other existing sound sources, AQMAU agrees with the consultant that the site is low risk.
- 3.18 These conclusions are based on the assumption that all mitigation measures within paragraph 7.6.3 of the consultant's NIA report are implemented in full.

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