TECHNICAL NOTE

Job Name: Trowbridge Bioresources - Wessex Water Environmental Permitting

Job No: 331101341/100.010104

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Prepared By: Matthew Barlow

Subject: **Noise and Vibration Risk Assessment**

1. Introduction

1.1. Stantec (UK) has been commissioned by Wessex Water (WW) to undertake a noise and vibration risk assessment to support a permit application for Trowbridge Bioresources (TB).

1.2. The application is being made due to changes to the Environment Agency (EA) interpretation of the environmental permitting exclusion for Urban Wastewater Activities (under Environmental Permitting (England and Wales) Regulations 2016 (EPR) Schedule 1, Part 2, Chapter 5, Section 5.4).

1.3. This technical note summarises the results of our review of the activities associated with the TB having regard to statutory guidance relating to noise and vibration.

2. EA Permitting Requirements - Noise

2.1. When applying for a permit, the Environment Agency may require a noise management plan to be submitted if:

- They consider there may be a risk of noise and vibration pollution beyond the site boundary; or
- A noise impact assessment has been prepared as part of a risk assessment.

2.2. The findings of any noise impact assessment should be considered as part of the wider environmental risk assessment.

2.3. If a noise and vibration management plan is required, it should be prepared following the guidance in Environmental Permitting: H3 part 2 Noise Assessment and Control[1].

Guidance on Risk Assessments

2.4. Risk assessments for permitting purposes should be undertaken in accordance with the Guidance on the preparation of risk assessments[2].

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T: +44 1173 327 840 E: bristolqueensquare@stantec.com

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/298126/LIT_8291_337647.pdf

[2] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

Horizontal Guidance Note for Noise Part 2 – Noise Assessment and Control

2.5. This guidance provides supplementary information to assist Applicants in preventing and minimising emissions of noise and vibration.

2.6. The assessment methodology is based primarily on the requirements detailed in BS4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas. This standard has been superseded by BS4142:2014+A1:2019, but the principles of the assessment methodology remain broadly similar.

2.7. The guidance document also provides an overview of the application of Best Available Techniques (BAT) to sites and processes.

Requirements for Quantitative Noise Impact Assessments

2.8. The information requirements of the EA with regards to what must be submitted if an assessment uses computer modelling or spreadsheet calculations are detailed in guidance 'Noise impact assessments involving calculations or modelling'[3]. This requirement is not applicable in this instance as a qualitative review methodology has been selected.

Basic Pre-Application Advice Note (v1)

2.9. A basic pre-application advice note[4] relating to Industrial Emission Directive (IED) permits for water and sewage companies has been provided by the Environment Agency.

2.10. With respect to noise, the note states that if the risk assessment indicates the operation is likely to cause noise or vibration beyond the site boundary then a noise impact assessment based on BS4142:2014+A1:2019 should be provided.

2.11. The assessment should be accompanied by a noise and vibration management plan informed by the results of the assessment and the H3 guidance.

3. Best Applicable Techniques (BAT)

3.1. In addition to the BAT detailed in the Horizontal Guidance Note for Noise Part 2, further information on BAT is detailed in the 'Commission Implementing Decision (EU) 2018/1147 of 10 August 2018'[5]. With respect to noise, section 1.4 states:

> ***BAT 17****. In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to set up, implement and regularly review a noise and vibration management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:*
>
> *1. A protocol containing appropriate actions and timelines;*
>
> *2. A protocol for conducting noise and vibration monitoring;*
>
> *3. A protocol for response to identified noise and vibration events, e.g. complaints;*
>
> *4. A noise and vibration reduction programme designed to identify the source(s), to measure/estimate noise and vibration exposure, to characterise the contributions of the sources and to implement prevention and/or reduction measures.*

[3] https://www.gov.uk/guidance/noise-impact-assessments-involving-calculations-or-modelling

[4] Water and sewage companies IED permits: Basic pre-application advice – supporting information (v1, March 2021)

[5] https://www.legislation.gov.uk/eudn/2018/1147

Applicability

The applicability is restricted to cases where a noise or vibration nuisance at sensitive receptors is expected and/or has been substantiated

***BAT 18.** In order to prevent or, where that is not practicable, to reduce noise and vibration emissions, BAT is to use one or a combination of the techniques given below.*

Technique		***Description***	***Applicability***
a.	*Appropriate location of equipment and buildings*	*Noise levels can be reduced by increasing the distance between the emitter and the receiver, by using buildings as noise screens and by relocating building exits or entrances.*	*For existing plans, the relocation of equipment and building exits or entrances may be restricted by a lack of space or excessive costs.*
b.	*Operational measures*	*This includes techniques such as:* *(i) inspection and maintenance of equipment;* *(ii) closing of doors and windows of enclosed areas, if possible;* *(iii) equipment operation by experienced staff;* *(iv) avoidance of noisy activities at night, if possible;* *(v) provisions for noise control during maintenance, traffic, handling and treatment activities.*	*Generally applicable.*
c.	*Low-noise equipment*	*This may include direct drive motors, compressors, pumps and flares.*	
d.	*Noise and vibration control equipment*	*This includes techniques such as:* *(i) noise reducers;* *(ii) acoustic and vibrational insulation of equipment;* *(iii) enclosure of noisy equipment;* *(iv) soundproofing of buildings.*	*Applicability may be restricted by a lack of space (for existing plants).*
e.	*Noise attenuation*	*Noise propagation can be reduced by inserting obstacles between emitters and receivers (e.g. protection walls, embankments and buildings).*	*Applicable only to existing plants, as the design of new plants should make this technique unnecessary. For existing plans, the insertion of obstacles may be restricted by a lack of space.* *For mechanical treatment in shredders of metal wastes, it is applicable within the constraints associated with the risk of deflagration in shredders.*

4. Project Proposals

4.1. Reference should be made to Section II of the full permit application for a technical description of the site activities covered by the permit variation application. A site layout and plan of the current TB assets is included as part of the application.

5. Noise and Vibration Risk Assessment

5.1. A preliminary noise risk assessment has been undertaken based on information provided by WW.

5.2. In considering the risks associated with the operations covered by the permit application, the following site-specific factors have been considered:

- The proximity and sensitivity of nearby receptors
- The existing environmental sound climate at the receptors
- The operational characteristics of the source
- The historical lack of noise complaints arising in respect of the operations carried out under the scope of the permit variation.

Noise and Vibration Sensitive Receptors

5.3. The sensitivity of a particular receptor depends on a variety of factors, but the following table provides examples of the types of receptors likely to be considered either high, medium or low sensitivity.

Table 1: Summary of Receptor Sensitivity

Sensitivity to Noise and Vibration	Description	Example Receptor
High	Receptors where people or operations are particularly sensitive to noise or vibration	Residential, including private gardens Quiet outdoor areas used for recreation Theatres/Auditoria/Studios Schools and Nurseries during the daytime Hospitals/residential care homes Places of worship
Medium	Receptors where noise or vibration may cause some distraction or disturbance	Offices Retail areas and other commercial developments Bars/Cafes/Restaurants where external noise may be intrusive Sports ground where quiet conditions are necessary (e.g. tennis, golf, bowls)
Low	Receptors where distraction or disturbance from noise and vibration is minimal	Industrial areas Sports ground with no specific requirement for quiet conditions Night clubs

5.4. For the purposes of this assessment, noise and vibration sensitive receptors are considered to be any existing occupied premises within 1km of the site which may be adversely affected by noise or vibration and has a high sensitivity. Receptors beyond this distance are unlikely to be significantly affected by noise or vibration from the TB.

5.5. In this instance the following receptors have been identified. Where appropriate, receptors have been grouped where they are within the same area. Due to the large number of receptors within 1km of the site, we have only identified those closest to the site boundary.

Table 2: Noise and Vibration Sensitive Receptors

Receptor Reference	Receptor Description	Receptor Type	Distance/Direction from Site Boundary (m)
A	Dwellings on Langford Road	Residential	390 E
B	Dwellings on Francis Street	Residential	395 SE
C	Dwellings on Farm Close	Residential	360 SSW
D	Dwellings on Trowle	Residential	440 W
E	Dwellings on Brick Lane	Residential	530 NE

5.6. Due to the nature of the sources present on site, the distance between the identified receptors and the site boundary, vibration from the operations at the site is unlikely to have an impact and is considered to be low risk. Vibration is therefore not considered further.

Existing Environmental Sound Climate

5.7. The site lies close to a number of sources of noise including the A369.

5.8. A limited environmental sound survey was undertaken in 2014 as part of a permit application for the CHP. Limited information is provided but the survey suggests that background sound levels at Receptor C are in the region of 26 dBA $L_{A90,T}$.

5.9. In addition to the above, a review of the strategic noise mapping data provided by Defra[6] has been undertaken. The noise mapping data is based on contributions from road sources.

5.10. A review of Defra's strategic noise mapping indicates that with the exception of Receptor D, sound levels are likely to fall below 50 dB $L_{Aeq,16hours}$ during the daytime (07:00 – 23:00 hours) and below 45 dB $L_{Aeq,8hours}$, during the night-time (23:00 – 07:00 hours).

5.11. Background sound levels in the vicinity of the site are therefore considered to be relatively low.

Operational Characteristics

5.12. The sources of noise associated with the permit include:

- The movement of vehicles around the site.
- The operation of plant items including the standby generator and the mixers associated with the Mesophillic digesters.

5.13. All of the activities described within the permit variation application are existing and will continue to operate in the same manner as their established use (e.g. hours of operation and load). There are no changes to activities or additional plant or equipment included as part of the permit variation.

Risk Matrix

5.14. Based on the Preliminary Noise Risk Assessment set out in Section 5, Table 3 details a risk matrix setting out overall risk levels associated with the IED related operations with regards to noise.

5.15. The combined assessment of the proposals in noise and vibration terms is that the probability of exposure and consequence are both low, with the overall risk level being low.

[6] https://www.gov.uk/government/publications/strategic-noise-mapping-2019

5.16. As there have been no noise complaints associated with PBC, and there are no significant changes proposed to the existing installation, BAT 17 as defined in 'Commission Implementing Decision (EU) 2018/1147 of 10 August 2018' is not considered to be applicable.

5.17. On the basis of the qualitative risk assessment carried out above and reported in Table 3, and in light of the operating history of the plant, no further controls are considered necessary in respect of the permitted operations. Site management practices included within WW's Environmental Management Systems (EMS), which include provisions for noise control and plant maintenance, will continue to be applied; no specific permit Noise Management Plan is considered necessary at this time. In the event of material changes to the local noise environment, or location or sensitivity of nearby receptors, or should substantiated complaints arise, this position should be reviewed as part of normal site management reviews and controls.

Table 3: Risk Matrix

Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk
Noise: Vehicular movements around site	Residential	Airborne	Vehicles will be screened from receptors. Deliveries would take place during the daytime hours only when background sound levels are higher.	Low - The risk management actions will prevent significant impact at nearest receptors	Low – Minor nuisance impacts	Low
Noise: Standby Generator	Residential	Airborne	The equipment is containerised in a high performance acoustically treated enclosure and designed for external applications. Tested yearly. Very occasional use	Low - The risk management actions will prevent significant impact at nearest receptors	Low – Minor nuisance impacts	Low
Noise: Mixers Associated with Mesophilic Digesters	Residential	Airborne	Plant is located a significant distance from receptors. Good maintenance of plant to ensure that excessive noise levels are not generated, under Operations & Maintenance contract Regular checks of noise mitigation measures fitted to items of plant. Where repair or replacement is required, the plant will, where possible, be taken out of service until repair or replacement of parts has been undertaken.	Low - The risk management actions will prevent significant impact at nearest receptors	Low – Minor nuisance impacts	Low
Noise: CHP & Exhaust	Residential	Airborne	The equipment is containerised in a high performance acoustically treated enclosure and designed for external applications. The equipment is controlled under Section 3.4 or permit EPR/HB3602TR/V001 which includes a noise condition to minimise impacts on nearby noise sensitive receptors.	Low - The risk management actions will prevent significant impact at nearest receptors	Low – Minor nuisance impacts	Low