Preliminary Noise and Vibration Impact Assessment

Proposed DCO Application for the Alteration and Construction of Hazardous Waste and Low Level Radioactive Waste Facilities, East Northants Resource Management Facility, Stamford Road, Northamptonshire

AUGEAN SOUTH LTD

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REPORT DETAILS

Client	Augean South Ltd
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Site Address	East Northants Resource Management Facility, Stamford Road, Northamptonshire
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QUALITY ASSURANCE

Issue No.	Issue Date	Comments	Author	Technical Review
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EXECUTIVE SUMMARY

1. Augean South Ltd is the operator of the East Northants Resource Management Facility and is proposing to submit an application for a Development Consent Order for an extension in the area and timescales for the operation of the site including an extension to the west of the existing site and increasing the throughput of the waste treatment and recovery facility. Vibrock Limited is commissioned to undertake a noise and vibration impact assessment of the proposals.

2. Existing sound levels were measured at locations chosen to represent sensitive premises in the vicinity of the site in 2011 and this information has been used to establish the baseline conditions for the Preliminary Environmental Information Report (PEIR). Further background noise monitoring will be undertaken prior to the submission of the DCO application.

3. Initial noise level predictions associated with the construction and operation of the proposed development have been calculated at nearby noise-sensitive premises. These worst-case predictions are based on information regarding the proposed working of the site and have been undertaken following calculation methods that are suitable for open sites such as landfill facilities.

4. The development has been assessed with reference to noise policy and guidance along with other technical guidance suitable for the assessment of noise and vibration from waste sites.

5. The outcome of the preliminary assessment suggests that the proposed scheme is not likely to result in any significant or unacceptable adverse impacts. A range of recommendations have been made to minimise potential noise and vibration emissions from the site during the implementation of the proposed scheme.

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1.0 INTRODUCTION

1.1 Overview

1.1.1 Augean South Ltd is the operator of the East Northants Resource Management Facility and is proposing to submit an application for a Development Consent Order for an extension in the area and timescales for the operation of the site including an extension to the west of the existing site and increasing the throughput of the waste treatment and recovery facility. Vibrock Limited is commissioned to undertake a noise and vibration impact assessment of the proposals.

1.1.2 This study benefits from an inspection and sound level monitoring undertaken at the existing site in July 2020. An assessment of the potential impact of noise emissions from the facility has been made with reference to national and local noise policy along with relevant technical guidance.

1.1.3 Further explanation of the terminology used within this report is provided in Section 8 of this document.

1.2 Current Situation

1.2.1 The existing ENRMF site lies approximately 1.7km east south east of Duddington village and approximately 2.6km north of Kings Cliffe village in the East Northamptonshire district of Northamptonshire. The existing highway access to the ENRMF site is from Stamford Road which is a minor road that runs adjacent to the eastern boundary of the site from the A47 to the north. The site formerly was known as Slipe Clay Pit and has a long history of mineral and waste development.

1.2.2 The existing ENRMF site comprises an active hazardous waste and low level radioactive waste (LLW) landfill site including completed and partially restored landfill areas together with a waste treatment and recovery facility. Current operations are the subject of Environmental Permits issued and regulated by the Environment Agency.

1.2.3 The operating hours of the site are as follows and will not change as part of the application:

Monday to Friday	0700 – 1800
Saturday	0700 – 1300

1.2.4 Noise emissions from the site are currently controlled via a Noise Management and Monitoring Scheme[1].

1.3 Proposed Development

1.3.1 The application boundary covers an area of approximately 57.5 hectares and includes the existing ENRMF site. The existing ENRMF site is approximately 31.2 hectares and the proposed western extension covers an area of approximately 26.3 hectares. A site location plan is provided in Figure 1.

1.3.2 The proposal includes the construction of new landfill void to the west of the currently consented hazardous waste and low level radioactive waste landfill area and the alteration of the restoration profile and the timescale for completion of the existing landfill site in order to integrate the final landscape of the existing site with the western extension. The application includes an increase in the consented

[1] MJCA Report Ref: AU/KCE/SPS/1604/01 dated March 2012

throughput of waste to the waste treatment and recovery facility and an increase in the total waste input rate to the site.

1.3.3 In order to construct the western extension void it will be necessary to win and work minerals including the extraction of soils, overburden and clay. The soils and some clay will be retained on site for use in site restoration and the construction of the low permeability engineered liner and capping layers. The remaining materials will be exported off site. The application includes the alteration of the operational period of the current site activities and the western extension to approximately December 2046.

1.4 Initial Consultation

1.4.1 The approach to the assessment has been discussed with an Environmental Health Officer at East Northamptonshire District Council. Northamptonshire County Council and the Environment Agency have also had the opportunity to review the assessment approach and provide comment.

1.4.2 Full details of this initial consultation are presented in Appendix 1. In summary, the proposed assessment methodology was considered to be acceptable with all responses also highlighting the need to consider any potential uncertainties associated with establishing the baseline conditions at a time when acoustic environments may be affected by the Covid-19 pandemic.

2.0 METHODOLOGY

2.1 INTRODUCTION

2.1.1 This section describes how noise and vibration emissions associated with the proposed development have been established and outlines the policy and guidance against which the impact assessment has been conducted.

2.2 NOISE POLICY AND GUIDANCE

2.2.1 National Planning Policy and Guidance

Noise Policy Statement for England (NPSE)

2.2.1.1 The NPSE[2] sets out the Government's policy on noise and includes the long term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

2.2.1.2 This long term vision is supported by the following aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;

[2] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.

- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

2.2.1.3 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- NOEL (No Observed Effect Level) – this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected.

2.2.1.4 Extending these concepts further, NPSE[3] leads to the concept of a significant observed adverse effect level:

- SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur.

2.2.1.5 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

National Planning Policy Framework (NPPF)

2.2.1.6 The revised NPPF[4] was updated on 19 June 2019 and sets out the government's planning policies for England and how these are expected to be applied. This document replaces the first NPPF published in March 2012, and includes minor clarifications to the revised versions published in July 2018 and February 2019.

2.2.1.7 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 'Conserving *and enhancing the natural environment*' as follows:

Paragraph 170:

Planning policies and decisions should contribute to and enhance the natural and local environment by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

Paragraph 180:

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

[3] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.
[4] National Planning Policy Framework – Ministry of Housing, Communities and Local Government. June 2019.

a) *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*

b) *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*

c) *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

Paragraph 182:

Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

2.2.1.8 Specifically in relation to mineral sites, the NPPF[5] provides guidance in Chapter 17 '*Facilitating the sustainable use of minerals*' as follows:

[5] Chapter 17: National Planning Policy Framework – Ministry of Housing, Communities and Local Government. June 2019.

Paragraph 203:

It is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. Since minerals are a finite natural resource, and can only be worked where they are found, best use needs to be made of them to secure their long-term conservation.

Paragraph 204:

Planning policies should:

a) *provide for the extraction of mineral resources of local and national importance, but not identify new sites or extensions to existing sites for peat extraction;*

b) *so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously;*

c) *safeguard mineral resources by defining Mineral Safeguarding Areas; and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked);*

d) set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development to take place;

e) safeguard existing, planned and potential sites for: the bulk transport, handling and processing of minerals; the manufacture of concrete and concrete products; and the handling, processing and distribution of substitute, recycled and secondary aggregate material;

f) set out criteria or requirements to ensure that permitted and proposed operations do not have unacceptable adverse impacts on the natural and historic environment or human health, taking into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;

g) when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction; and

h) ensure that worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place.

Paragraph 205:

When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy. In considering proposals for mineral extraction, minerals planning authorities should:

a) *as far as is practical, provide for the maintenance of landbanks of non-energy minerals from outside National Parks, the Broads, Areas of Outstanding Natural Beauty and World Heritage Sites, scheduled monuments and conservation areas;*

b) *ensure that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality;*

c) *ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties;*

d) *not grant planning permission for peat extraction from new or extended sites;*

e) *provide for restoration and aftercare at the earliest opportunity, to be carried out to high environmental standards, through the application of appropriate conditions. Bonds or other financial guarantees to underpin planning conditions should only be sought in exceptional circumstances;*

f) *consider how to meet any demand for small-scale extraction of building stone at, or close to, relic quarries needed for the repair of heritage assets, taking account of the need to protect designated sites; and*

g) recognise the small-scale nature and impact of building and roofing stone quarries, and the need for a flexible approach to the duration of planning permissions reflecting the intermittent or low rate of working at many sites.

Paragraph 206:

Local planning authorities should not normally permit other development proposals in Mineral Safeguarding Areas if it might constrain potential future use for mineral working.

Planning Practice Guidance (PPG)

2.2.1.9 PPG is written in support of the NPPF[6] and provides an increased level of specific planning guidance.

2.2.1.10 PPG-Noise[7] states that noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced).

2.2.1.11 PPG-Noise[8] states that plan-making and decision taking need to take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur;

and

[6] National Planning Policy Framework – Ministry of Housing, Communities and Local Government. June 2019.

- whether or not a good standard of amenity can be achieved.

2.2.1.12 In line with the Explanatory note of the NPSE[9] this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level (SOAEL) and the lowest observed adverse effect level (LOAEL) for the given situation.

2.2.1.13 When noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'No Observed Effect Level'. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it.

2.2.1.14 As the exposure increases further, it crosses the LOAEL boundary above which the noise starts to cause small changes in behaviour and attitude and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

2.2.1.15 Increasing noise exposure will at some point cause the SOAEL boundary to be crossed. Above this level the noise causes a material change in behaviour. If the exposure is predicted to be above this level the planning process should be used to avoid, but not necessarily prevent, this effect occurring, for example through use of appropriate mitigation such as by altering the design and layout.

2.2.1.16 Table 1 summarises the noise exposure hierarchy from PPG-Noise[10].

[7] Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019. Paragraph: 001 Reference ID: 30-001-20190722
[8] Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019. Paragraph: 003 Reference ID: 30-003-20190722
[9] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.

[10] Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019.

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 1. Noise Exposure Hierarchy (PPG-Noise)[11]

[11] Planning Practice Guidance – Noise Paragraph: 005 Reference ID: 30-005-20190722

2.2.1.17 The supporting 'Minerals' PPG[12] is the current Government advice applicable to the control of noise from surface mineral workings in England and recognises that planning for the supply of minerals has a number of special characteristics that are not present in other development.

2.2.1.18 It includes the following appropriate noise standards for 'normal operations';

"Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For any operations during the period 2200 – 0700 noise limits should be set to *reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) $L_{Aeq,1h}$ (free field) at a noise sensitive property.*[13]

2.2.1.19 The same document includes instances where particularly noisy short-term activities may occur and the *appropriate* criteria for such circumstances;

"Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and *maintenance. Increased temporary daytime*

[12] Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014.
[13] Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014. Paragraph: 021 Reference ID: 27-021-20140306

noise limits of up to 70dB(A) $L_{Aeq,1h}$ (free field) for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered *to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs. Where work is likely to take longer than eight weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) $L_{Aeq,1h}$ (free field) limit referred to above should be regarded as the normal maximum".*[14]

2.2.1.20 The suitability of each proposed mineral site, whether an extension to an existing site or a new site, must be considered on its individual merits but thought should also be given to the cumulative impact of proposals in an area.

2.2.1.21 Some parts of a mineral planning authority area may have been subjected to successive mineral development over a number of years. Mineral planning authorities should include *appropriate* policies in their minerals local plan, where appropriate, to ensure that the cumulative impact of a proposed mineral development on the community and the environment will be acceptable.

2.2.1.22 The cumulative impact of mineral development is also capable of being a material consideration when determining individual planning applications.[15]

[14] Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014. Paragraph: 022 Reference ID: 27-022-20140306
15 Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014. Paragraph: 017 Reference ID: 27-017-20140306

2.2.2 Local Planning Policy

Minerals and Waste Local Plan

2.2.2.1 The Local Plan[16] is the land use planning strategy for minerals and waste related development in the county. It provides the basis for investment in new minerals and waste development in Northamptonshire, and where in the county it should go to. The adopted Local Plan provides the basis for determining planning applications for, or covering, minerals and waste related development in Northamptonshire.

2.2.2.2 Policy 18, shown below, is relevant to this impact assessment.

Addressing the impact of proposed minerals and waste development Proposals for minerals and waste development must demonstrate that the following matters have been considered and addressed:

- *protecting Northamptonshire's natural resources and key environmental designations (including heritage assets),*
- *avoiding and / or minimising potentially adverse impacts to an acceptable level, specifically addressing air emissions (including dust), odour, bioaerosols, noise and vibration, slope stability, vermin and pests, birdstrike, litter, land use conflict and cumulative impact,*
- *impacts on flood risk as well as the flow and quantity of surface and groundwater,*
- *ensuring built development is of a design and layout that has regard to its visual appearance in the context of the defining characteristics of the local area,*

- *ensuring access is sustainable, safe and environmentally acceptable, and ensuring that local amenity is protected.*

Where applicable a site-specific management plan should be developed to ensure the implementation and maintenance of mitigation measures throughout construction, operation, decommissioning and restoration works.

2.2.3 Technical Guidance

BS 4142:2014+A1:2019

2.2.3.1 British Standard 4142[17] describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

1) sound from industrial and manufacturing processes;
2) sound from fixed installations which comprise mechanical and electrical plant and equipment;
3) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
4) sound from mobile plant and vehicles that is an intrinsic part of the overall
5) sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

[16] Northamptonshire County Council Minerals and Waste Local Plan 2017.

[17] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.

2.2.3.2 The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

2.2.3.3 This standard is intended to be used for the purposes of:

a) investigating complaints;

b) assessing sound from existing, proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and

c) assessing sound at proposed new dwellings or premises used for residential purposes.

2.2.3.4 This standard is not intended to be applied for the following purposes:

- The determination of noise amounting to a nuisance;
- The assessment of indoor sound levels;
- The assessment of low-frequency noise;
- The assessment of sound from the passage of vehicles on public roads and railway systems;
- The assessment of sound from recreational activities, including all forms of motorsport;
- music and other entertainment;
- shooting grounds;
- construction and demolition;
- domestic animals;
- people;

- public address systems for speech;
- The assessment of sound from other sources falling within the scopes of other standards or guidance.

2.2.3.5 The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. When making assessments and arriving at decisions it is essential to place the sound in context.

2.2.3.6 The sound level from a source when determined as a discrete entity, distinct and free of other influences contributing to the ambient sound, is referred to as the 'specific sound level'. The specific sound level is evaluated, at an identified assessment location, over the appropriate reference time interval which is as follows:

- 1 hour during the daytime (07:00 – 23:00); and
- 15 minutes during the night-time (23:00 – 07:00).

NB. The shorter reference time interval at night means that short duration sounds with an on time of less than 1 hour can lead to a greater specific sound level when determined over the reference time interval during the night than when determined during the day.

2.2.3.7 The specific noise may be subject to an acoustic character correction if the noise level at the assessment location is subjectively considered to exhibit certain acoustic features that could increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level.

2.2.3.8 This standard requires the assessor to consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention. Such features are taken into account by applying the corrections summarised in Table 2 to the specific sound level to obtain the rating level as follows:

Subjective Prominence	Tonality	Impulsivity	Intermittency	Other Sound Characteristic (neither tonal, nor impulsive, nor intermittent)
Just Perceptible	+2 dB	+3 dB	-	-
Clearly Perceptible	+4 dB	+6 dB	-	-
Highly Perceptible	+6 dB	+9 dB	-	-
Readily Distinctive Against Residual	-	-	3 dB	3 dB

Table 2. Summary of BS 4142 Acoustic feature corrections based on subjective prominence

2.2.3.9 If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others then it might be appropriate to apply a reduced or even zero correction for the minor characteristics. The rating level is equal to the specific sound level if there are no such features present or expected to be present.

2.2.3.10 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level, and consider the following.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB or more is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

2.2.3.11 Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) The absolute level of sound.

2) The character and level of the residual sound compared to the character and level of the specific sound.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

   i) façade insulation treatment;

ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

iii) acoustic screening.

2.2.3.12 Response to sound can be subjective and is affected by many factors both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood. This edition of the standard recognises the importance of the context in which a sound occurs.

Horizontal Guidance Note IPPC H3 (part 2) Noise Assessment and Control

2.2.3.13 IPPC H3 (part 2) guidance[18] has been produced by the Environment Agency for England and Wales in collaboration with the Scottish Environment Protection Agency (SEPA) and the Northern Ireland Environment and Heritage Service (EHS).

2.2.3.14 Integrated Pollution Prevention and Control (IPPC) is a regulatory system that employs an integrated approach to control the environmental impacts of certain industrial activities such as waste facilities.

2.2.3.15 Part 2 describes the principles of noise measurement and prediction and the control of noise by design, by operational and management techniques and abatement technologies. Section 2.3.3 Part 2 references BS 4142 as a method of evaluating noise from industrial activities.

[18] Integrated Pollution Prevention and Control (IPPC) Horizontal Guidance for Noise Part 2 – Noise Assessment and Control. Environment Agency. v3 June 2004.

2.2.3.16 Section 2.3.3.7 highlights that waste disposal sites may share many common features with surface mineral working, and suggests that Operators and planning authorities may therefore also wish to take account of the planning practice guidance relating to noise emissions from mineral sites.

Calculation of Road Traffic Noise (CRTN)

2.2.3.17 CRTN[19], issued by the Department of Transport and Welsh Office, describes the procedures for calculating noise from road traffic.

2.2.3.18 The calculation method uses a number of input variables including traffic flow volume, average vehicle speed and percentage of heavy goods vehicles, to predict the noise level for any receptor point at a given distance from the road.

2.2.3.19 All noise levels are expressed in terms of the index L_{10} hourly or L_{10} (18-hour) dB(A). The value of L_{10} hourly dB(A) is the noise level exceeded for just 10% of the time over a period of one hour. The L_{10}(18 -hour) dB(A) is the arithmetic average of the values of L_{10} hourly dB(A) for each of the eighteen one-hour periods between 0600 to 2400 hours.

Design Manual for Roads and Bridges (DMRB) – LA 111 Noise and Vibration

2.2.3.20 DMRB LA 111[20] sets out the requirements for assessing and reporting the effects of highways noise and vibration from construction, operation and maintenance projects.

[19] Calculation of Road Traffic Noise (CRTN) Department of Transport / Welsh Office. 1988.
[20] Design Manual for Road and Bridges. Sustainability and Environment. LA111 Noise and Vibration Revision 2. Highways England May 2020.

2.2.3.21 LA 111 outlines a method for determining traffic noise level changes via a comparison of calculated Basic Noise Levels (BNL). BNL calculations are undertaken by using traffic flow, speed and HGV percentage to calculate a reference noise emission from a road link as set out in CRTN. Once this comparative analysis has been undertaken the magnitude of change shall be defined in accordance with LA 111 as shown in Tables 3 and 4 below.

Short term magnitude	Short term noise change (dB $L_{A10,18hr}$ or L_{night})
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	less than 1.0

Table 3. LA111 Magnitude of change – short term

Long term magnitude	Long term noise change (dB $L_{A10,18hr}$ or L_{night})
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	less than 3.0

Table 4. LA111 Magnitude of change – long term

2.2.3.22 LA111 suggest that road traffic noise level changes of 1 dB in the short-term and 3 dB in the long-term are considered to be negligible and therefore not significant.

2.2.3.23 In general terms, a change in noise level of +1 dB is equivalent to a 25% increase in traffic flow and a change of +3 dB is equivalent to a 100% increase in traffic flow assuming other factors, such as vehicle speed, remain unchanged.

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise

2.2.3.24 BS 5228-1[21] provides guidance on the prediction, measurement, assessment and control of noise generated from construction sites.

2.2.3.25 Annex E.3.2 refers to an assessment approach known as the 'ABC method'. This method is adopted to identify whether the level of construction noise impacting neighbouring residents is significant based on the existing pre-construction ambient noise level.

2.2.3.26 Primarily, the ABC Method requires the ambient noise level for the appropriate period (daytime, evening/weekends or night-time) to be measured and rounded to the nearest 5 dB. From this the relevant Category (A, B or C) can then be determined as shown in table 5 below.

Assessment category and threshold value period	**Threshold value, in decibels (dB) (LAeq,T)**		
	Category A A)	**Category B B)**	**Category C C)**
Night-time (23.00–07.00)	45	50	55
Evenings and weekends D)	55	60	65
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	65	70	75

[21] BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise. British Standards Institution 2014.

NOTE 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level. *NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.* *NOTE 3 Applied to residential receptors only.*
A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values. B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values. C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values. D) 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

Table 5. Threshold of potential significant effect at dwellings

2.2.3.27 To perform an assessment the category threshold value is then compared with the site noise level. If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated.

2.2.3.28 The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect.

BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration

2.2.3.29 This part of BS 5228[22] gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations

[22] BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Vibration. British Standards Institution 2014.

generate significant vibration levels. Guidance is provided concerning methods of measuring vibration and assessing its effects on the environment.

2.2.3.30 In terms of the human response to vibration the threshold of perception is typically in the PPV range of 0.14 mms^{-1} to 0.3 mms^{-1}. As vibrations increase above these values they can disturb, startle, cause annoyance or interfere with work activities. At higher levels they can be described as unpleasant or even painful. Guidance on the effects of vibration levels is reproduced in Table 6 below.

Vibration Level (PPV)	Effect
0.14 mms^{-1}	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mms^{-1}	Vibration might be just perceptible in residential environments.
1.0 mms^{-1}	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10 mms^{-1}	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

Table 6. Guidance on effects of vibration levels

BS 6472-1:2008 Guide to Evaluation of Human Exposure to Vibration in Buildings

2.2.3.31 BS 6472-1[23] provides general guidance on human exposure to building vibration in the range of 0.5 Hz to 80 Hz. The standard gives Vibration Dose Value (VDV) for the basis of assessment.

2.2.3.32 Human reaction to vibration depends on displacement, frequency, the duration (exposure time), point of application and direction of the vibration. The units in

which VDV are measured are metres per second raised to the power of minus 1.75 (or $ms^{-1.75}$).

2.2.3.33 BS 6472-1 gives VDV ranges which might result in various probabilities of adverse comment by those who experience the vibration within residential buildings as shown in Table 7.

Location	Low Probability of adverse comment ($ms^{-1.75}$) [1]	Adverse comment possible ($ms^{-1.75}$)	Adverse comment probable ($ms^{-1.75}$) [2]
Residential Buildings (16 hour Day 07:00 – 23:00)	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential Buildings (8 hour Night 23:00 – 07:00)	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

[1] *Below these ranges adverse comment is not expected*
[2] *Above these ranges adverse comment is very likely*

Table 7. VDV ranges which might result in various probabilities of adverse comment within residential buildings

BS 7385-2: 1993 Evaluation and Measurement for Vibration in Buildings

2.2.3.34 BS 7385-2[24] provides guidance on the assessment of the possibility of vibration-induced damage in buildings due to a variety of sources.

2.2.3.35 It gives guidance on the levels of both transient and continuous ground borne vibration above which building structures could be damaged.

23 BS 6472-1 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than Blasting. British Standards Institution 2008.
[24] BS 7385-2 Evaluation and measurement for vibration in buildings - Part 2: Guide to damage levels from groundborne vibration. British Standards Institution 1993.

2.2.3.36 Only the direct effect of vibration on buildings is considered. The indirect effects on the building structure due to ground movement, the movement of loose objects within buildings, the possibility of damage to sensitive equipment and the effect of vibration on people are outside the scope of this standard.

2.2.3.37 Limits for transient vibration, above which 'cosmetic' damage to residential buildings could occur are given numerically in Table 8.

Type of Building	**Peak component particle velocity in frequency range of predominant pulse ***	
	4 Hz to 15 Hz	**15 Hz and above**
Unreinforced or light Framed structures Residential or light Commercial type buildings	15 mm/s at 4 Hz Increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz Increasing to 50 mm/s at 40 Hz and above
** Values referred to are at the base of the building*		

Table 8. Transient vibration guide values for cosmetic damage

2.2.3.38 Minor damage is possible at vibration magnitudes which are greater than twice those given in the table, and major damage to a building structure may occur at values greater than four times the tabulated values.

2.3 NOISE AND VIBRATION SOURCES

2.3.1 A site inspection and an acoustic survey of the existing site were performed on 16 July 2020 during which the site was operating normally. The purpose of this monitoring was to obtain site specific sample measurements for use within this assessment to estimate noise from the proposed development.

2.3.2 The main noise and vibration generating activities observed during the survey include:

- The tipping of materials;
- The loading and unloading of materials by mobile plant such as tele-handlers, excavators and loading shovels;
- HGV and dumptruck movements;
- The operation of the waste treatment and recovery facility;
- Engineering works including cell construction and capping.

2.3.3 Monitoring was undertaken using a Norsonic 140 Type 1 Precision Sound Analyser (Serial No. 1403165). During all measurements the microphone was protected with an outdoor windshield and the following set-up parameters were used:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: Manual (various according to activity)

2.3.4 Site activities occurring during the on-site sample measurements were considered to be representative of typical operating conditions and the measurement durations were considered to be representative of any longer term fluctuations in the specific sound. The influence of sound from other sources was minimised by measuring at times when the residual sound had subsided to a relatively low level.

2.3.5 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a Norsonic 1251 Acoustic Calibrator (Serial No. 34488). No significant drift in the calibration value was observed between the initial and final checks.

2.3.6 The findings of the survey are presented in Table 9. Sample measurements of the sound pressure level obtained at known distances from plant and activities at the site have been used to calculate the sound power level of each noise source or noise-generating activity at the site with reference to the method outlined within BS 5228-1[25]. The noise sources are ranked from highest to lowest.

Source	Measured Sound Pressure Level dB(A)	Calculated Sound Power Level dB(A)
Excavator loading dumptruck	L_{Aeq} 72.1 at 20m	106.1
Dozer	L_{Aeq} 83.6 at 5m	105.6
Tanker Compressor	L_{Aeq} 82.1 at 5m	104.0
360 Excavator loading HGV	L_{Aeq} 76.0 at 10m	103.8
Loading Ash Hopper with telehandler	L_{Aeq} 75.1 at 10m	103.0
Dumptruck (movements)	L_{Amax} 74.9 at 10m	102.9
Soil Plant (Treatment)	L_{Aeq} 73.3 at 10m	101.3
Loading Shovel Loading Dumptruck	L_{Aeq} 73.4 at 10m	101.1
Tipping of materials	L_{Aeq} 72.2 at 10m	100.3
Road Lorry (movements)	L_{Amax} 71.0 at 10m	99.0
Telehandler (Unloading)	L_{Aeq} 70.2 at 10m	98.2
Dust Suppression Unit (Cannon)	L_{Aeq} 70.3 at 10m	98.2
Generator	L_{Aeq} 76.1 at 5m	98.1
Leachate Pump	L_{Aeq} 72.7 at 5m	94.9
HGV manoeuvring on weighbridge	L_{Aeq} 66.3 at 10m	94.3
Plant 4 (Treatment)	L_{Aeq} 71.7 at 5m	93.7
Wheelwash	L_{Aeq} 70.5 at 5m	92.6

[25] Annex C. BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise. BSI 2014.

Source	Measured Sound Pressure Level dB(A)	Calculated Sound Power Level dB(A)
Wheelwash Pump	L_{Aeq} 74.5 at 3m	91.8
Wheelwash Generator	L_{Aeq} 68.3 at 5m	90.5
Laboratory Extract Plant	L_{Aeq} 65.3 at 4m	85.5
HGV idling on weighbridge	L_{Aeq} 62.0 at 5m	84.0

Table 9. Calculated sound power levels based on measurements of plant and activities at the existing ENRMF site (July 2020).

2.4 NOISE LEVEL PREDICTIONS

2.4.1 Introduction

2.4.1.1 The level of noise in the local environs that arises from a site will depend on a number of factors. The more significant of which are:

(a) the sound level output of the plant or equipment used on site;

(b) the periods of operation of the plant on site;

(c) the distance between the source noise and the receiving position;

(d) the presence of screening due to barriers;

(e) the reflection of sound;

(f) soft ground attenuation.

2.4.1.2 For the purposes of the PEIR, noise levels associated with the proposed development have been calculated at the identified noise-sensitive receptor locations based on the following methodologies and assumptions.

2.4.1.3 The detailed design for the proposed development is currently being progressed and the calculations presented in this report are based simply on the proposed DCO application boundary without the use of detailed phasing plans.

2.4.1.4 The design development process is iterative and will continue throughout the consultation period up to the submission of the DCO application. As a result it is likely that the noise emission calculations will need to be revised as the scheme develops. These initial calculations should be seen only as indicative at this stage.

2.4.2 Calculation Methodology

2.4.2.1 In order to assist in the calculation of noise levels from the proposed development, CadnaA noise modelling software has been used. The prediction method used is that outlined within Annex F of BS 5228-1[26]. This guidance details methods to estimate noise from 'open sites' which can include quarries, waste sites and long-term construction projects.

2.4.2.2 The most important elements of this standard used to estimate site noise within this assessment include the sound level of plant/activities, distance attenuation, activity on-time, screening effects, ground absorption and angle of view corrections.

2.4.2.3 Screening has been calculated in accordance with Figure F.3 of BS 5228-1 which allows for the attenuation of a barrier or topographical feature to be calculated in octave bands by examining the path difference created by the screen as well as the frequency of the sound. The level of attenuation provided by any screening has

[26] BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise. British Standards Institution 2014.

been calculated in octave bands from 63 Hz to 8 kHz using spectra obtained via measurement of plant and activities at the existing ENRMF site.

2.4.2.4 For all noise prediction calculations, the ground absorption coefficient has been estimated according to the combination of soft and hard ground conditions present between the source and receiver position. 'Soft' ground is taken to refer to surfaces which are absorbent to sound, e.g. grassland, cultivated land or plantations as opposed to 'hard' ground surfaces which reflect sound such as paving, asphalt and surface water.

2.4.2.5 The attenuation from screening and soft ground attenuation have not been combined (where applicable). Instead, either the attenuation from screening and hard ground propagation, or the attenuation provided by soft ground alone has been included in the calculation, whichever is the greater of the two.

2.4.2.6 Predictions have been made to locations representing private external amenity areas at a height of 1.5 metres above ground level and at least 3.5 metres from any reflecting surface other than the ground. The predictions made are 'free-field' sound levels to allow for an appropriate comparison with the free-field background sound levels measured during the survey.

2.4.2.7 For the purposes of the PEIR, and until detailed phasing plans become available, all noise level predictions have been calculated with the combinations of mobile plant working at the closest point of the application site to the receptor location. The calculations are therefore worst case scenarios which may be of relatively short duration. However, they indicate the potential highest $L_{Aeq,1h}$ (free-field) noise level to which a particular property or group of properties may be exposed during the working of the site. By definition, the worst-case situation may occur intermittently

over the lifetime of the site, but longer term noise levels perceived outside of the site boundary would normally be significantly less.

2.4.2.8 The convention applied throughout this report, is that all measured or calculated numbers are rounded to the nearest whole number with 0.5 being rounded up.

2.4.3 Noise Model Inputs

2.4.3.1 Tables 10 – 14 detail the inputs used within the noise modelling software.

Parameter	Input
Software	DataKustik GmbH CadnaA
Calculation Standards/Guidelines	BS 5228
Model of Terrain	Triangulation
Max. Order of Reflection	2
Ground Absorption	*G* = 0.9
Ground Absorption (hardstanding areas on the site)	*G* = 0.1
Max. Search Radius (m)	5000.00
Max. Error (dB)	0.1
Grid Height (m)	1.5 (relative)
Off-site buildings	Not included
Contours (site)	Detailed Topo Survey
Contours (off site)	10m intervals

Table 10. Noise model configuration

Description	X (m)	Y (m)	Z (m)
Westhay Cottages	501270.3	300038.7	85.1
Westhay Farm	501339.4	299902.9	84.0
Westhay Lodge	501386.7	299127.1	71.5
Cuckoo Lodge	500331.5	301702.9	92.0
Duddington Village	499071.3	300830.3	60.3

Table 11. Noise-sensitive premises location details

Description	X (m)	Y (m)	Z (m)
Gas Abstraction Plant	500476.35	300164.49	84.5
Waste Treatment Plant	500563.93	300101.79	87.3
Generator (Pad Security Lighting)	500561.40	300123.98	83.9
Wheelwash	501131.68	299807.28	86.0
Weighbridge	501228.73	299891.77	85.5
Laboratory Ventilation	501262.12	299841.47	85.5

Table 12. Static Noise Source Location Details

Plant/Activity	Sound Power Level dB(A)	Activity 'on-time'	Height Above Ground (m)	Data Source
Lab Ventilation	85.5	100%	2.5	Measurement
HGV manoeuvring on weighbridge	94.3	5%	1.5	Measurement
HGV idling (weighbridge)	84.0	50%	1.5	Measurement
HGV idling (laboratory)	84.0	25%	1.5	Measurement

Plant/Activity	Sound Power Level dB(A)	Activity 'on-time'	Height Above Ground (m)	Data Source
Wheelwash Generator	90.5	100%	1.5	Measurement
Wheelwash Pump	91.8	10%	1.5	Measurement
Wheelwash	92.6	10%	2.0	Measurement
Leachate Pump	94.9	100%	1.0	Measurement
Leachate Pump	94.9	100%	1.0	Measurement
Leachate Pump	94.9	100%	1.0	Measurement
Leachate Pump	94.9	100%	1.0	Measurement
Gas Abstraction Plant	98.0	100%	3.0	Previous NIA
Plant 4	93.7	50%	2.5	Measurement
Tanker Compressor	104.0	50%	2.0	Measurement
Soil Plant	101.3	100%	2.5	Measurement
Loading Ash Hopper With telehandler	103.0	25%	2.5	Measurement
Road Lorry (movements)	99.0	40/hr (2 way) 10 mph	1.5	Measurement
Loading Shovel	101.1	25%	2.5	Measurement
360 Excavator Loading HGV	103.8	25%	2.5	Measurement
Dumptruck (Processing)	102.9	24/hr (2 way) 10 mph	2.0	Measurement
Telehandler (Ash)	98.2	25%	2.0	Measurement
Telehandler (Lab)	98.2	25%	2.0	Measurement
Telehandler (Cell)	98.2	25%	2.0	Measurement

Plant/Activity	Sound Power Level dB(A)	Activity 'on-time'	Height Above Ground (m)	Data Source
Tipping of materials	100.3	10%	2.0	Measurement
Dust Suppression Unit	98.2	100%	1.0	Measurement
Dumptruck (Engineering)	102.9	100/hr (2 way) 10 mph	2.0	Measurement
Excavator (Engineering)	106.1	75%	2.5	Measurement
Excavator (Engineering)	106.1	75%	2.5	Measurement
Excavator (Mineral)	106.1	25%	2.5	Measurement
Dozer	105.6	50%	2.0	Measurement
Waste Compactor	102.6	25%	1.5	BS 5228 Table C.8 Ref no. 4
Generators (Pad + Contractor)	98.1	100%	1.5	Measurement

Table 13. Noise source calculation inputs

Plant/Activity	Octave band sound pressure levels (dB)							
	63	125	250	500	1k	2k	4k	8k
Laboratory Extract Plant	83	82	84	85	81	75	69	60
HGV manoeuvring on weighbridge	97	95	88	89	91	88	81	74
HGV idling on weighbridge	96	85	75	77	79	78	75	68
Wheelwash Generator	93	98	95	87	82	80	73	66
Wheelwash Pump	87	90	87	90	88	84	71	56
Wheelwash	98	95	94	88	89	84	78	70
Leachate Pump	102	104	94	91	86	85	82	89

Plant/Activity	Octave band sound pressure levels (dB)							
	63	125	250	500	1k	2k	4k	8k
Gas Compound	91	91	91	91	91	91	91	91
Plant 4	103	101	98	90	87	81	75	69
Tanker Compressor	101	96	92	96	100	100	90	81
Soil Plant	108	102	98	100	97	93	87	84
Loading Ash Hopper With telehandler	96	97	93	94	97	98	96	89
Road Lorry (movements)	107	100	99	95	95	91	85	77
Loading Shovel Loading Dumptruck	106	106	100	94	97	94	85	79
360 Excavator loading HGV	103	106	103	100	99	95	94	87
Telehandler	102	101	98	96	93	89	85	85
Tipping of materials	97	100	100	95	96	93	88	81
Dust Suppression Unit	106	104	101	96	91	88	83	78
Dumptruck (movements)	101	104	105	95	99	95	89	80
Excavator loading dumptruck	109	116	103	104	100	97	91	85
Dozer	100	108	107	104	101	94	88	84
Waste Compactor	100	104	104	98	97	95	91	86
Generators (Pad + Contractor)	104	105	103	94	90	86	80	74

Table 14. Noise source octave band sound levels

2.4.4 Modelling Results

2.4.4.1 The following table summarises the sound level predictions at each assessment location.

Assessment Location	Indicative Worst-Case Site Noise Level dB(A)	
	Daytime	Night-time
Westhay Cottages	40	20
Westhay Farm	44	24
Westhay Lodge	39	23
Cuckoo Lodge	40	25
Duddington Village	31	19

Table 15. Noise level predictions

3.0 BASELINE

3.1 Current Baseline

3.1.1 The COVID-19 pandemic has presented new challenges in obtaining representative baseline sound levels because typical road, air and rail transport usage have been reduced by travel restrictions and social distancing measures.

3.1.2 Background noise monitoring was undertaken by Vibrock Ltd in March 2011[27] as part of an application for a previous extension to the ENRMF site. Monitoring was conducted at the 4 locations shown in Figure 2 and the approach was agreed with Environmental Protection at East Northamptonshire Council. A review of current noise sensitive receptor locations in the vicinity of the proposed development suggests that these receptors remain appropriate for inclusion within any future noise impact assessment and it is understood that no new noise-sensitive development has occurred in closer proximity to the site during the intervening period.

3.1.3 For the purposes of the PEIR, the background noise data measured during the 2011 survey has been temporarily adopted as a baseline against which to make an initial assessment of noise impact for the potential western extension. Once the acoustic environment in the vicinity of the ENRMF site is considered to be suitably representative a new baseline noise survey will be undertaken to establish the current background noise levels at the identified assessment locations. It is anticipated that this could be undertaken in late 2020 or early 2021. The survey will

27 Vibrock report ref. R11.6219/5/LD Assessment of Environmental Noise. Westerly Extension of East Northants Resource Management Facility, Kings Cliffe, Northamptonshire. 8 September 2011.

be undertaken with reference to the guidance provided with BS 4142[28], BS 7445[29] and the ANC Environmental Noise Measurement Guide[30].

3.2 Previous Baseline

3.2.1 Details of the baseline noise monitoring undertaken in 2011 are presented below.

Survey Methodology

3.2.2 Noise levels were measured by Vibrock Ltd during a 24 hour period from 1200 hrs on Monday 7th March to 1300 hrs on the 8th March 2011 at locations selected to represent noise-sensitive premises in the vicinity of the site.

3.2.3 A plan showing the 2011 noise monitoring locations is provided in Figure 2.

Instrumentation

3.2.4 Monitoring was undertaken using the following equipment detailed in Table 16.

Manufacturer	Type	Serial No.
Cirrus	Class 1 Integrating Sound Level Meter CR:800B	B15811FF
	Class 1 Integrating Sound Level Meter CR:800B	B12615FF
	Class 1 Integrating Sound Level Meter CR:800B	D20222FD
	Class 1 Integrating Sound Level Meter CR:800B	B15879FF
	Acoustic Calibrator CRL:511D	38520

Table 16. Noise monitoring equipment details

[28] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.
[29] BS 7445-1:2003 Description and measurement of environmental noise – Part 1 Guide to quantities and procedures. British Standards Institution 2003.
[30] ANC Guidelines: Environmental Noise Measurement Guide. 2013.

3.2.5 During the survey the microphones were protected with a suitable outdoor windshield and mounted on a tripod.

3.2.6 The monitoring positions were 'free field' (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

3.2.7 The following set-up parameters were used:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: 15 minutes
- Data Logging: Repeat (Contiguous)

3.2.8 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a sound calibrator. No significant drift (i.e. no greater than ±0.5 dB) in the calibration value was observed between the initial and final checks.

Weather Conditions

3.2.9 Weather conditions during the survey were dry and settled with a light east-south-easterly breeze.

Results

3.2.10 A summary of the measured sound levels is presented in Table 17 below.

Location	Daytime (0700 - 1900)			Evening (1900 - 2200)			Night-time (2200 - 0700)		
	L_{Aeq} dB	L_{A90} dB	L_{Amax} dB	L_{Aeq} dB	L_{A90} dB	L_{Amax} dB	L_{Aeq} dB	L_{A90} dB	L_{Amax} dB
Westhay Cottages and Farm	54	40	78	48	30	79	48	31	80
Westhay Lodge	49	33	78	47	28	73	42	26	81
Cuckoo Lodge	60	50	81	58	43	73	55	35	82
Duddington Village	53	46	76	50	39	78	50	38	77

Table 17. 2011 Baseline Noise Survey Summary Data

4.0 PRELIMINARY ASSESSMENT OF EFFECTS

4.1 BS 4142 Assessment

4.1.1 This standard requires the following levels to be established:

- The Background Sound Level
- The Specific Sound Level
- The Rating Level

Background Sound Level

4.1.2 BS 4142 requires the quantification of typical background sound levels at locations representing the noise-sensitive receptors. The results of a baseline survey conducted in 2011 are presented in Section 3.2.10 of this report.

Specific Sound Level

4.1.3 The specific sound level has been determined by calculation using 3D noise modelling software and the guidance within Section 7 of BS 4142 and Annex F of BS 5228[31]. The method of calculation is detailed in Section 2.4 of this report.

Rating Level

4.1.4 In determining the Rating Level it is recognised that certain acoustic features can increase the significance of noise impact.

[31] BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise. British Standards Institution 2014.

4.1.5 Whilst the noises sources under assessment produce occasional impulsive sounds and exhibit intermittency, when observed in close proximity, these acoustic features are not considered to be discernible or readily distinctive against the residual acoustic environment at the assessment locations. When current operations were observed from locations in the vicinity of Westhay Farm, Westhay Cottages and Westhay Lodge (the closest residential receptors to the site) during the recent site visit it was subjectively considered that there were no acoustically distinguishing characteristics that were significant enough to warrant the application of a correction. In terms of the proposed development it is not considered that this will exacerbate the prominence of any acoustic features or introduce any new acoustic features at the site.

4.1.6 Where there are no acoustic features expected to be present at the assessment locations the rating level is equal to the specific sound level.

Initial Estimate

4.1.7 Table 18 presents an 'initial estimate' of the potential impact of the proposals during the daytime in accordance with BS 4142[32].

Assessment Location	Daytime Background Sound Level ($L_{A90,15min}$ dB)	Specific Sound Level ($L_{Aeq,1h}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Initial Estimate Excess of rating over background sound level (dB)
Westhay Cottages	40	40	0	40	**0**
Westhay Farm	40	44	0	44	**+4**

[32] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.

Assessment Location	Daytime Background Sound Level ($L_{A90,15min}$ dB)	Specific Sound Level ($L_{Aeq,1h}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Initial Estimate Excess of rating over background sound level (dB)
Westhay Lodge	33	39	0	39	**+6**
Cuckoo Lodge	50	40	0	40	**-10**
Duddington Village	46	31	0	31	**-15**

Table 18. Initial Estimate of Impact during the Daytime (BS 4142)

4.1.8 It is understood that the gas abstraction plant along with a generator used for security lighting on the pad and a generator associated with the engineering contractor's compound could operate at night.

4.1.9 Potential night-time noise emissions have therefore also been assessed as shown in Table 19.

Assessment Location	Night-time Background Sound Level ($L_{A90,15min}$ dB)	Specific Sound Level ($L_{Aeq,15min}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Initial Estimate Excess of rating over background sound level (dB)
Westhay Cottages	31	20	0	20	**-9**
Westhay Farm	31	24	0	24	**-7**
Westhay Lodge	26	23	0	23	**-3**
Cuckoo Lodge	35	25	0	25	**-10**

Assessment Location	Night-time Background Sound Level ($L_{A90,15min}$ dB)	Specific Sound Level ($L_{Aeq,15min}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Initial Estimate Excess of rating over background sound level (dB)
Duddington Village	38	19	0	19	**-19**

Table 19. Initial Estimate of Impact during the Night-time (BS 4142)

4.1.10 The above assessment demonstrates that the rating level is estimated to be up to 6 dB above the daytime background sound level depending on assessment location. Night-time rating levels are estimated to be at least 3 dB below the background sound level.

4.1.11 Typically, the greater the difference between the rating level and the background sound level, the greater the magnitude of the impact. BS 4142[33] states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. A difference of around +5 dB is likely to be an indication of an adverse impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

4.1.12 It should be noted that the initial estimate is not to be considered in isolation and due regard to the following sections on context and uncertainty should also be made.

[33] Section 11. BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.

Context

4.1.13 In addition to the initial estimate of noise impact which has determined the excess of rating level over the background sound level, the following should also be considered as part of the impact assessment process:

- *Operational Period* – The most significant noise sources associated with the site operate during the daytime period only when there is a lower likelihood of adverse impact compared to operations during more sensitive periods such as the night-time.

- *Absolute Level of Sound* – Absolute noise levels from site operations are expected to remain within the noise limits specified within the approved noise management and monitoring scheme currently in operation at the site. Site noise levels are also well below the measured ambient noise levels at each assessment location. Despite the excess of rating over background sound level suggesting a potential adverse impact at Westhay Farm and Westhay Lodge it should be noted that potential worst-case external noise levels from the facility of 44 dB and 39 dB respectively during the daytime are low. Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. Noise emissions from the site are considered likely to have little impact on residents using private external amenity areas during the daytime.

- *Character of the Sound* – As part of the assessment the character of the proposed sound has been assessed and it is not considered that any acoustic features will increase the significance of noise impact. The

proposed development will not exacerbate the prominence of any acoustic features or introduce any new acoustic features at the site.

- *Control Measures* – The site operates in accordance with a Noise Management and Monitoring Scheme.
- *Assessment Approach* – All noise level predictions have been calculated with the combinations of plant working at the closest point to the receptor location. The calculations are therefore worst case scenarios which may be of relatively short duration. However, they indicate the potential highest $L_{Aeq,1h}$ (free-field) noise level to which a particular property or group of properties may be exposed during the working of the site. By definition, the worst-case situation may occur intermittently over the lifetime of the site, but longer term noise levels perceived outside of the site boundary would normally be significantly less.
- *Proposed Scheme* – The western extension of the site will move some operations further away from the nearest noise-sensitive receptor locations which are to the east of the existing site.

Uncertainty

4.1.14 Whilst it is accepted that uncertainty can occur throughout all aspects of the measurement and assessment process, the approach undertaken at all stages has been adopted with the aim of reducing uncertainty via the implementation of good practice. During this process reference has been made to BS 4142[34] Annex B '*Consideration of uncertainty and good practice for reducing uncertainty*'.

[34] Annex B. BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.

4.1.15 The following list details the key steps taken to reduce uncertainty:

- Background sound level measurements were made in close proximity to the assessment locations and over a long duration to fully characterise the acoustic environment. The 2011 baseline survey utilised for the purposes of this preliminary noise impact assessment will be repeated when suitably representative background sound levels prevail;
- Measurement procedures were in accordance with Section 6 of BS 4142 including precautions against interference such as unsuitable weather conditions;
- Site noise emissions levels were determined by measurement calculation with reference to Section 7 of BS 4142 and utilising the methodology outlined within BS 5228[35], which is a widely accepted standard for the calculation of sound propagation from open sites;
- Site activities occurring during the on-site sample measurements were considered to be representative of typical operating conditions and the measurement durations were considered to be representative of any longer term fluctuations in the specific sound. The influence of sound from other sources was minimised by measuring at times when the residual sound had subsided to a relatively low level;
- The instrumentation used was in accordance with Section 5 of BS 4142. Use of digital transfer methods and equipment whose conformity and calibration have been checked periodically.

[35] BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise. British Standards Institution 2014.

Outcome

4.1.16 Following an initial estimate of noise impact, along with consideration of the context and any potential effects of uncertainty, it is considered that the implementation of the proposed scheme is not likely to result in 'adverse' or 'significant adverse' impacts in accordance with BS 4142[36].

4.2 Planning Practice Guidance – Minerals

4.2.1 Waste disposal sites share many common features with surface mineral working, and planning authorities often take account of the Government guidance relating to noise emissions from mineral sites[37] when evaluating the noise impact of waste development. Historically, this has been the case at the ENRMF site.

4.2.2 PPG-Minerals states that mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) during normal working hours (0700 – 1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) $L_{Aeq,1h\ (free\ field)}$. For operations during the evening (1900-2200) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq,1h\ (free\ field)}$. For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) $L_{Aeq,1h\ (free\ field)}$ at a noise sensitive property[38].

[36] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.

[37] Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014.

[38] Paragraph: 021 Reference ID: 27-021-20140306. Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. 2014.

4.2.3 Tables 20 and 21 below demonstrate that when the indicative worst-case site noise levels are compared to the PPG minerals guidance it can be seen that potential noise levels associated with the proposed development are not expected to exceed the daytime background level by more than 10 dB nor exceed the recommended maximum daytime limit of 55 dB. Furthermore, night-time noise levels during night-time periods are expected to remain well within the recommended 42 dB limit.

Assessment Location	Daytime Background Sound Level	Site Noise Level dB	Difference	
			Background Sound Level	PPG Limit of 55 dB
Westhay Cottages	40	40	0	-15
Westhay Farm	40	44	+4	-11
Westhay Lodge	33	39	+6	-16
Cuckoo Lodge	50	40	-10	-15
Duddington Village	46	31	-15	-24

Table 20. Assessment against PPG-Minerals Noise Standards (Daytime)

Assessment Location	Night-time Background Sound Level	Site Noise Level dB	Difference between site noise and PPG Limit of 42 dB
Westhay Cottages	31	20	-11
Westhay Farm	31	24	-7
Westhay Lodge	26	23	-3

Assessment Location	Night-time Background Sound Level	Site Noise Level dB	Difference between site noise and PPG Limit of 42 dB
Cuckoo Lodge	35	25	-10
Duddington Village	38	19	-19

Table 21. Assessment against PPG-Minerals Noise Standards (Night-time)

4.2.4 When noise associated with the proposed application is considered against this guidance, it is demonstrated that the potential noise impacts are not likely to be significant.

4.3 Planning Practice Guidance – Noise

4.3.1 In relation to the noise exposure hierarchy outlined in PPG-Noise[39] which supports the NPPF[40] and NPSE[41], it is suggested that potential noise at the most affected noise-sensitive premises is likely to be occasionally present but not intrusive and therefore considered to be at or below the 'Lowest Observed Adverse Effect Level (LOAEL). At this level noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. It can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.

4.3.2 The proposed development is therefore considered to be consistent with the aims of the NPSE and NPPF which seek to avoid noise giving rise to significant adverse impacts on health and the quality of life and also mitigate and reduce to a minimum potential adverse impacts of noise.

[39] Paragraph: 005 Reference ID: 30-005-20190722. Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019.
[40] National Planning Policy Framework – Ministry of Housing, Communities and Local Government. June 2019.

4.4 Road Traffic Noise and Vibration

4.4.1 The potential noise and vibration impacts from HGV movements associated with the proposals on the road network will be considered with reference to the guidance presented within CRTN[42], DMRB[43], BS 6472[44], BS 5228[45] and BS 7385[46].

4.4.2 The traffic numbers associated with the currently consented activities at the site are being reviewed to determine whether there will be any significant changes as a result of the proposed development.

4.4.3 At this stage it is understood that the probable average number of movements is unlikely to change significantly as a result of this application. It is also expected that the proposed extension will not lead to any increase in activity or vehicle movements to and from the site by staff or visitors.

4.5 Construction Noise and Vibration

4.5.1 Based on the results of the 2011 noise survey and with reference to the 'ABC method' detailed in Annex E.3.2 of BS 5228-1, table 21 below specifies a threshold level at noise-sensitive premises above which there could be a significant effect during the construction phase of the development.

[41] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.
[42] Calculation of Road Traffic Noise (CRTN) Department of Transport / Welsh Office. 1988.
[43] Design Manual for Road and Bridges. Sustainability and Environment. LA111 Noise and Vibration Revision 2. Highways England May 2020.
[44] BS 6472-1 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than Blasting. British Standards Institution 2008.
[45] BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. British Standards Institution 2014
[46] BS 7385-2 Evaluation and measurement for vibration in buildings - Part 2: Guide to damage levels from groundborne vibration. British Standards Institution 1993.

Location	Daytime Ambient Noise Level dB(A)	Rounded to nearest 5 dB	Category	Threshold Level * dB(A)
Westhay Cottages	54	55	A	**65**
Westhay Farm	54	55	A	**65**
Westhay Lodge	49	50	A	**65**
Cuckoo Lodge	60	60	A	**65**
Duddington Village	53	55	A	**65**
** threshold values relate to the average site noise level ($L_{Aeq,T}$) over the duration of the working day.*				

Table 22. Threshold of potential significant effects at dwellings from Construction Noise

4.5.2 When the indicative worst-case site noise levels (presented in Table 15) are compared to the noise threshold levels of 65 dB(A) defined in Table 20 above it is suggested that the potential noise levels associated with the construction phase of the application are likely to remain within the recommended threshold values and are therefore not considered to be significant.

4.6 Assessment Summary

4.6.1 An assessment of potential noise and vibration impact has been made with reference to current planning policy and guidance along with a number of technical guidance documents.

4.6.2 The results of the preliminary assessment suggest that there are unlikely to be any significant or unacceptable adverse impacts at sensitive premises in the vicinity of the proposed operations.

4.6.3 At this stage, the assessment indicates that the overall potential impact of the development is likely to be in line with national and local planning policy which seeks to prevent and avoid any significant or unacceptable adverse impacts and, where necessary, mitigate and reduce to a minimum other adverse impacts.

4.6.4 Measures to minimise noise and vibration emissions from the site are outlined in Chapter 5 of this report.

5.0 MITIGATION AND MONITORING

5.1 Noise Management and Monitoring

5.1.1 Noise emissions from the site are currently controlled via a Noise Management and Monitoring Scheme (MJCA Report Ref: AU/KCE/SPS/1604/01 dated March 2012). It is anticipated that a similar scheme will be implemented for the extended site the subject of the DCO application. The Noise Monitoring and Management Scheme will be reviewed and submitted with the DCO application.

5.2 Noise and Vibration Minimisation and Control

5.2.1 The following noise control measures should be emphasised during the on-going management of noise from site operations to demonstrate best practice and minimise any potential noise impacts:

- The permitted operating hours of the site should be strictly adhered to and effectively communicated to all site staff and subcontractors;
- Ensure machinery is regularly well maintained and where appropriate fitted with exhaust silencers;
- Keep vehicle routes through the site well maintained and free from defects such as pot-holes. Avoid the use of speed humps;
- Avoid unnecessary horn usage and revving of engines;
- Switch off or throttle-down equipment when not required;
- Minimise drop heights of materials where possible;

- Any covers, panels or enclosure doors should be kept closed when the equipment is in use;
- Where reasonably practicable, noisy equipment should be located as far from sensitive premises as possible;
- Plant and vehicles should be started up sequentially rather than all together. Any period of idling required to warm up mobile plant at the start of the working day should be undertaken in locations away from residential premises;
- In the event of any emergency or unforeseen circumstances arising that cause safety to be put at risk, it is important that every effort be made to ensure that the work in question is completed as quickly and as quietly as possible and with the minimum of disturbance to people living or working nearby.

6.0 CUMULATIVE IMPACTS

6.1 The cumulative impact of mineral and waste development is capable of being a material planning consideration when determining individual planning applications. Hence it is necessary to consider the cumulation of the impact with the impact of other existing and/or approved development.

6.2 A review of the area surrounding the application site indicates that Collyweston Quarry lies approximately 500m to the west of the proposed western extension area.

6.3 Noise-sensitive premises potentially affected by the cumulative effects of noise are restricted to residential dwellings in the village of Duddington. However as part of the assessment worst-case external noise level associated with the proposed DCO application are estimated to be around 31 dB $L_{Aeq,1h}$ (free-field) at residential premises on the east side of the village which are in closest proximity to the ENRMF site and Collyweston Quarry. Noise levels of this magnitude, which are estimated to be at least 15 dB below the daytime background sound level, will make no perceptible contribution to cumulative noise levels associated with the operation of both Collyweston Quarry and the ENRMF site.

6.4 In terms of the proposed ENRMF development itself, any cumulative impact associated with the continuation of operations at the existing ENRMF site and the creation of the amended restoration profile will be considered as part of the final noise impact assessment in combination with any concurrent operations within the proposed western extension area. The impact of simultaneous mineral extraction and landfilling will also be considered once detailed phasing plan become available.

6.5 It is intended that the following working scenarios will be considered either individually or in combination as appropriate:

- Construction of the new void including extraction of minerals, stockpiling of materials and formation of the landfill containment system;
- Operation of the landfill to 2046;
- Operation of the waste treatment and recovery facility up to 2046 including the operation of a mobile crusher on a campaign basis;
- Removal of the waste treatment and recovery facility by 2046;
- Restoration;
- The period following cessation of waste management activities at the site.

7.0 BIBLIOGRAPHY

ANC Guidelines: Environmental Noise Measurement Guide. 2013.

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise. British Standards Institution 2014.

BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration. British Standards Institution 2014.

BS 6472-1:2008 Guide to Evaluation of Human Exposure to Vibration in Buildings. Vibration sources other than blasting. British Standards Institution 2008.

BS 7385-2: 1993 Evaluation and Measurement for Vibration in Buildings. Guide to damage levels from groundborne vibration. British Standards Institution 1993.

BS 7445-1:2003 Description and measurement of environmental noise – Part 1 Guide to quantities and procedures. British Standards Institution 2003.

Calculation of Road Traffic Noise (CRTN) Department of Transport / Welsh Office. 1988.

Design Manual for Road and Bridges. Sustainability and Environment. LA111 Noise and Vibration Revision 2. Highways England May 2020.

Guidelines for Environmental Noise Impact Assessment, v1.2. Institute of Environmental Management & Assessment. November 2014.

Guidance: Noise impact assessments involving calculations or modelling. Environment Agency. October 2018.

Integrated Pollution Prevention and Control (IPPC) Horizontal Guidance for Noise Part 2 – Noise Assessment and Control. Environment Agency. v3 June 2004.

Northamptonshire Minerals and Waste Local Plan. Northamptonshire County Council. Adopted July 2017.

National Planning Policy Framework – Ministry of Housing, Communities and Local Government. June 2019.

Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.

Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014.

Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019.

8.0 GLOSSARY OF TECHNICAL TERMS

A-weighting	The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.
Abstraction	The removal of water or gas from any source either permanently or temporarily.
Acoustic Environment	Sound from all sound sources as modified by the environment.
Aftercare	The steps necessary to manage the land following restoration so that the quality of the land is at a satisfactory standard for the planned afteruse.
Ambient Sound Level $L_{Aeq,T}$	Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.
Background Sound Level $L_{A90,T}$	The A-weighted sound pressure level of the residual sound at the assessment position that is exceeded for 90% of a given time interval, T, measured using time weighting F.
Basic Noise Level	The basic noise level (BNL) is a measure of source noise.
BAT	Best Available Techniques. The available techniques which are the best for preventing or minimising emissions and impacts on the environment.
Bund	A low bank or wall of material used to store soils or to provide a visual or acoustic screen.
Cumulative impact	The combined positive and negative impacts on a specific receptor or medium.
DEFRA	Government Department for Environment, Food and Rural Affairs

Disposal	Emplacement of waste in an appropriate facility without the intention of retrieval.
EA	Environment Agency. The national environmental regulator.
EIA	Environmental Impact Assessment. A process to assess the environmental implications of proposals.
Environmental Statement (ES)	The document that reports the findings of an Environmental Impact Assessment.
EP	Environmental Permit. The authorisation issued by the Environment Agency when it is satisfied that the operation can be operated without pollution of the environment or harm to human health.
EPR2016	The Environmental Permitting (England and Wales) Regulations 2016. The principal regulations controlling waste management.
Equivalent continuous A-weighted sound pressure level $L_{Aeq,T}$	Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T, has the same mean square sound pressure as a sound under consideration whose level varies with time.
Free-field Level	The sound pressure level away from reflecting surfaces. Measurements made 1.2 - 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces are usually regarded as free-field.
Ha	Hectare. A unit of area.
$L_{A10,18hr}$	The noise level, in dB, that is exceeded 10% of the time between 0600 and 2400.
Landfill gas	An end product of the degradation of biodegradable wastes in a landfill site comprising largely methane and carbon dioxide.

Leachate	Liquid which seeps through waste in a landfill and becomes contaminated by the deposited waste. The leachate is collected in a drainage layer constructed below the waste in each landfill cell.
LLW	Low Level Radioactive Waste. With certain specific exceptions LLW is defined as waste which has an activity concentration in the range 0.4 – 4,000 Bq/g for alpha emitters and up to 12,000 Bq/g for beta-gamma emitters.
LOAEL	Lowest observed adverse effect level.
NGR	National Grid Reference.
NOEL	No observed effect level.
NPPF	National Planning Policy Framework which provides the primary policy basis for planning decisions.
NPSE	Noise Policy Statement for England.
PPG	Planning Practice Guidance.
PPV	Peak Particle Velocity. The instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position.
Rating Level $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.
Reference Time Interval, T_r	The specified interval over which the specific sound level is determined. This is 1hr during the day (07:00-23:00) and a shorter period of 15 min at night (23:00-07:00).
Residual Sound Level $L_{Aeq,T}$	Ambient sound remaining at a given position in a given situation when the specific sound source is suppressed to a degree such that it does not contribute to the ambient sound.
SOAEL	Significant observed adverse effect level.

Sound Power Level, L_{WA}	The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in. It is a logarithmic measure of the sound power in comparison to a specified reference level.
Specific Sound Level (also referred to as 'site noise') $L_{Aeq,Tr}$	Sound in the neighbourhood of a site that originates from the site i.e. the sound being assessed. The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment position over a given reference time interval.
VDV	Vibration Dose Value. A measure of the total vibration experienced over a specified period of time.

FIGURE 1

Location Plan

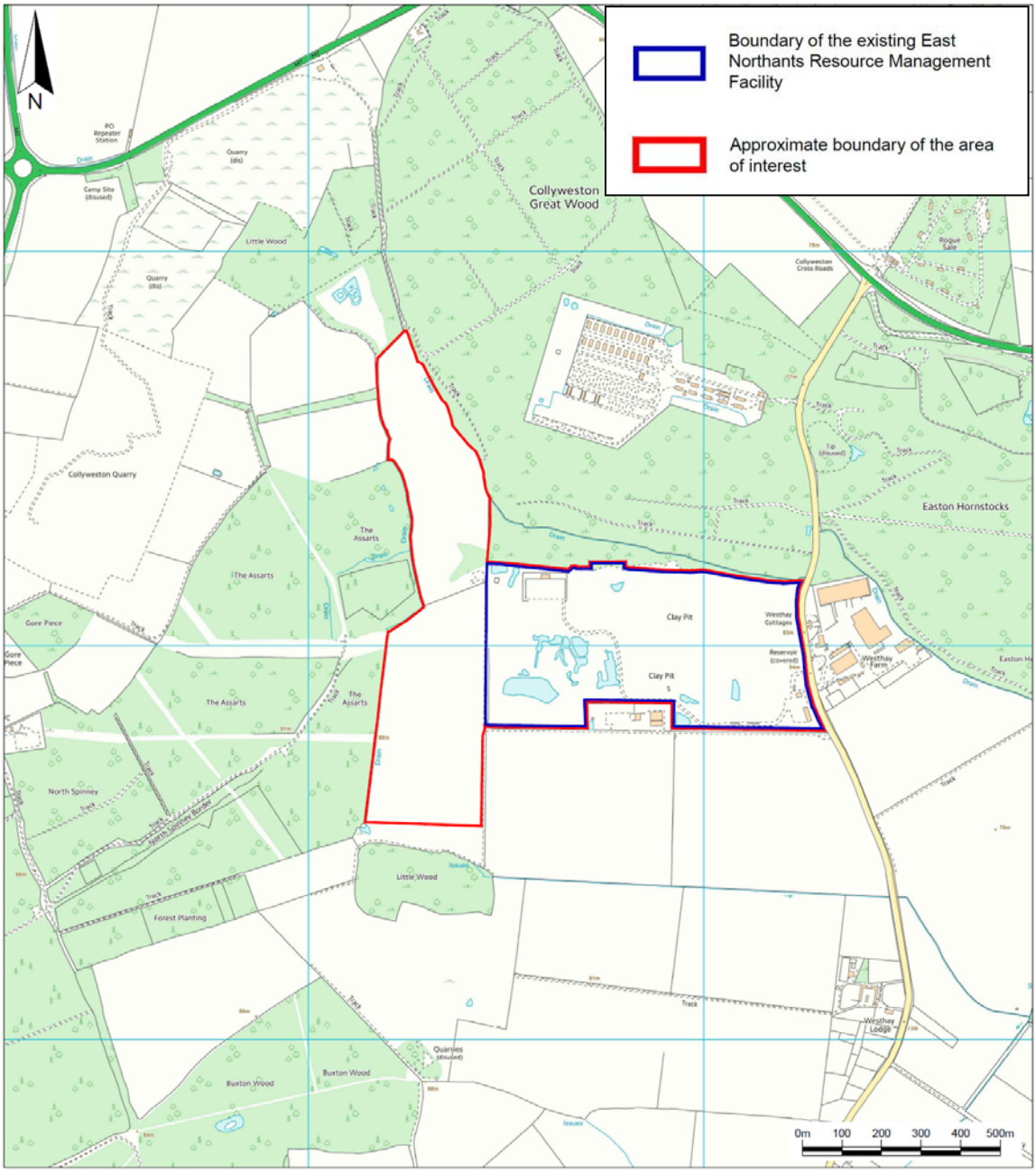
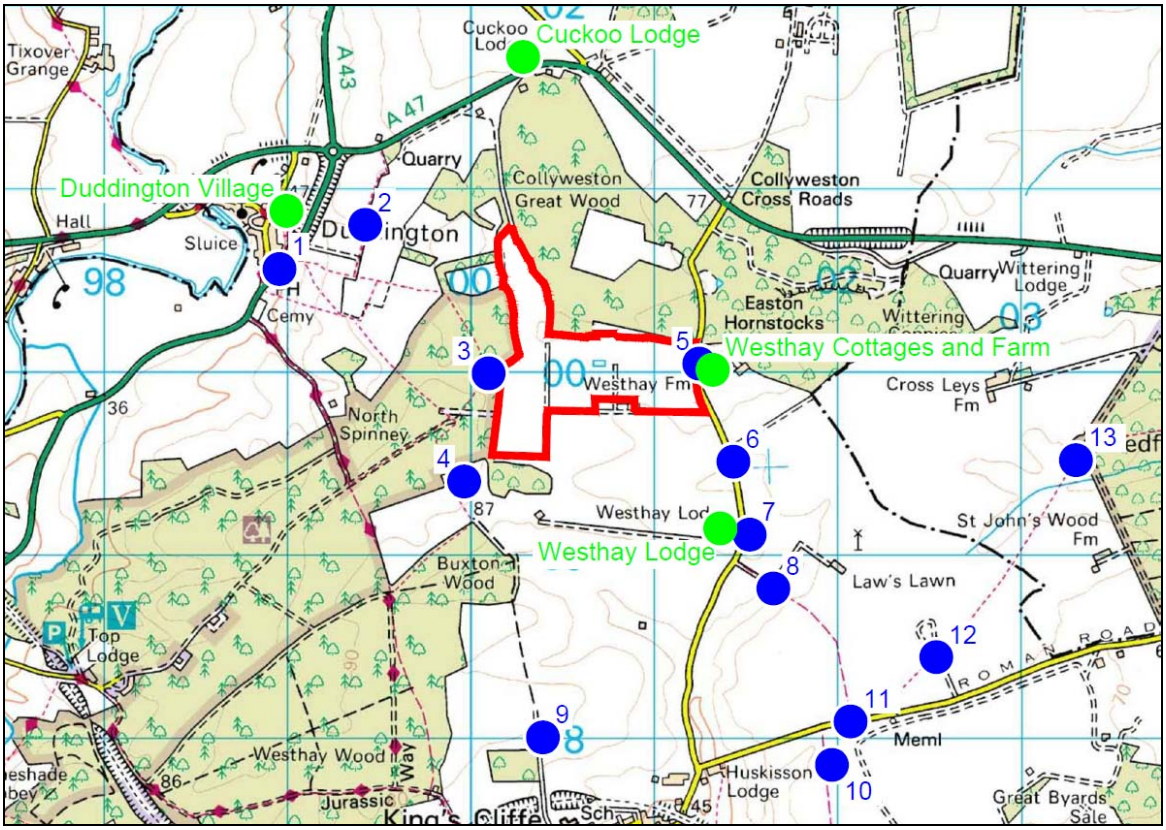


FIGURE 2

Noise Assessment Locations



Approximate boundary of the area the subject of the application for the Development Consent Order

1 Approximate location of the agreed landscape and visual impact assessment viewpoints

Approximate location of the noise assessment locations

APPENDIX 1

Details of Initial Consultation – NVIA Methodology

Email to East Northamptonshire Council Requesting Comment on the Proposed Assessment Methodology

From: Andrew Pickford
Sent: Tuesday, May 26, 2020 4:05 PM
To: envprotect@east-northamptonshire.gov.uk
Subject: Potential Extension to ENRMF - Proposed Noise Impact Assessment Methodology

Good afternoon,

Vibrock Ltd have been instructed by Augean plc to undertake a noise impact assessment to accompany a planning application for a proposed western extension to East Northants Resource Management Facility (ENRMF) at Stamford Road, Kings Cliffe, PE8 6XX.

I would like to propose an assessment methodology for consideration by the Environmental Protection department in order to agree upon a suitable approach prior to undertaking this work. Back in 2011/12 Vibrock undertook a similar study at this site and consulted with [redacted], however, I understand that [redacted] may no longer be at East Northamptonshire Council.

I would appreciate it if the proposed approach, detailed in the attachment which accompanies this email, could reviewed and comment provided.

Should you have any questions, please do not hesitate to contact me using the details below.

Kind Regards

Andrew Pickford
E: [redacted]

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APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Email to Northamptonshire County Council Requesting Comment on the Proposed Assessment Methodology

From: Andrew Pickford
Sent: Thursday, June 18, 2020 1:04 PM
To: [redacted]@northamptonshire.gov.uk
Subject: Potential Extension to ENRMF - Noise

Good afternoon [redacted],

Vibrock Ltd have been instructed by Augean plc to undertake a noise impact assessment to accompany a planning application for a potential western extension to East Northants Resource Management Facility (ENRMF) at Stamford Road, Kings Cliffe, PE8 6XX. I understand you may have recently provided comments on the LVIA viewpoints.

I would like to propose a noise assessment methodology for consideration by Development Control in order to agree upon a suitable approach prior to undertaking this work.

I would appreciate it if the proposed approach, detailed in the attachment which accompanies this email, could reviewed and comment provided. We are also seeking comment from [redacted], Senior EHO at East Northamptonshire and the Environment Agency.

Should you have any questions, please do not hesitate to contact me using the details below.

Kind Regards

Andrew

Andrew Pickford
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APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Email to Environment Agency Requesting Comment on the Proposed Assessment Methodology

From: Andrew Pickford
Sent: Thursday, June 18, 2020 1:07 PM
To: [redacted]@environment-agency.gov.uk

Good afternoon [redacted],

Vibrock Ltd have been instructed by Augean plc to undertake a noise impact assessment to accompany a planning application for a potential western extension to East Northants Resource Management Facility (ENRMF) at Stamford Road, Kings Cliffe, PE8 6XX. I understand you are the regulatory officer for this site.

I would like to propose a noise assessment methodology for consideration by the EA in order to agree upon a suitable approach prior to undertaking this work.

I would appreciate it if the proposed approach, detailed in the attachment which accompanies this email, could reviewed and comment provided. We are also seeking comment from [redacted], Senior EHO at East Northamptonshire and [redacted], Development Control Manager at Northamptonshire County Council.

Should you have any questions, please do not hesitate to contact me using the details below.

Kind Regards

Andrew

Andrew Pickford
E: [redacted]

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APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Proposed Noise Impact Assessment Methodology (1 of 4)

26.05.20

Site: East Northants Resource Management Facility (ENRMF), Stamford Road, Kings Cliffe, PE8 6XX.

Proposal: Potential western extension to the existing ENRMF site

See attached Figure 1 showing the current site and the potential western extension area. If the application progresses the application boundary will comprise the current site and the potential western extension area.

Noise – Proposed Survey and Assessment Methodology

Survey

The COVID-19 outbreak presents new challenges in obtaining representative baseline sound levels because typical road, air and rail transport usage have been reduced by travel restrictions and social distancing measures.

Under normal circumstances, it would be proposed that baseline monitoring is conducted continuously and simultaneously at the 4 locations shown on Figure 2 over a period of at least 24 hours. The monitoring data would be used to establish the prevailing acoustic environment at existing noise-sensitive receptors within the vicinity of the site.

Joint guidance issued by The Association of Noise Consultants and The Institute of Acoustics in March 2020 suggested that, whilst normal working practices have been impacted, there will be a continuing requirement to maintain as far as possible the standard of working practices, to maintain the flow of acoustic reporting which has an important role in the fabric and functioning of society, and to allow the planning process (and other relevant processes) to continue as smoothly as possible, without what could be a delay of many months.

The joint guidance suggests other approaches that could be taken to establish an appropriate robust estimate of baseline conditions, such as using existing data (for example, from previous local surveys and noise maps). Fortunately, in the case of this proposed development, extensive background noise monitoring was undertaken by Vibrock Ltd in March 2011 as part of an application for a previous extension to the site. Monitoring was conducted at the 4 locations shown in Figure 2 and the approach was agreed with Environmental Protection at East Northamptonshire Council. A review of current noise-sensitive receptor locations in the vicinity of the proposed development suggests that these receptors remain appropriate for inclusion within any future noise impact assessment and it is understood that no new noise-sensitive development has occurred in closer proximity to the site during the intervening period.

At present the Covid-19 pandemic is continuing to result in environmental sound climates that may vary quite significantly from representative conditions. It is therefore proposed that, should monitoring of the current baseline conditions not be possible, the background noise data measured during the 2011 survey will be adopted as a suitable baseline against which to make an assessment of noise impact for the potential western extension.

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Proposed Noise Impact Assessment Methodology (2 of 4)

26.05.20

Assessment

Noise from the development will be assessed with reference to the NPPF and associated planning practice guidance along with any relevant local policy. In terms of technical noise guidance, emissions from operations associated with the potential western extension will be assessed primarily with reference to BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' along with other relevant guidance and criteria as appropriate.

Noise predictions associated with the proposed development will be carried out using the methods in BS 5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites*'. It is intended the sample noise measurements of noise-generating plant and activities at the current ENRMF site will be obtained to provide representative noise emission data for inclusion within these calculations.

It is understood that the proposals will not result in an increase in HGV traffic on the local road network and hence an assessment of road traffic noise will not be undertaken.

Where necessary mitigation measures will be recommended to ensure that there are no significant or unacceptable adverse impacts to residential amenity.

APPENDIX 1 (cont)

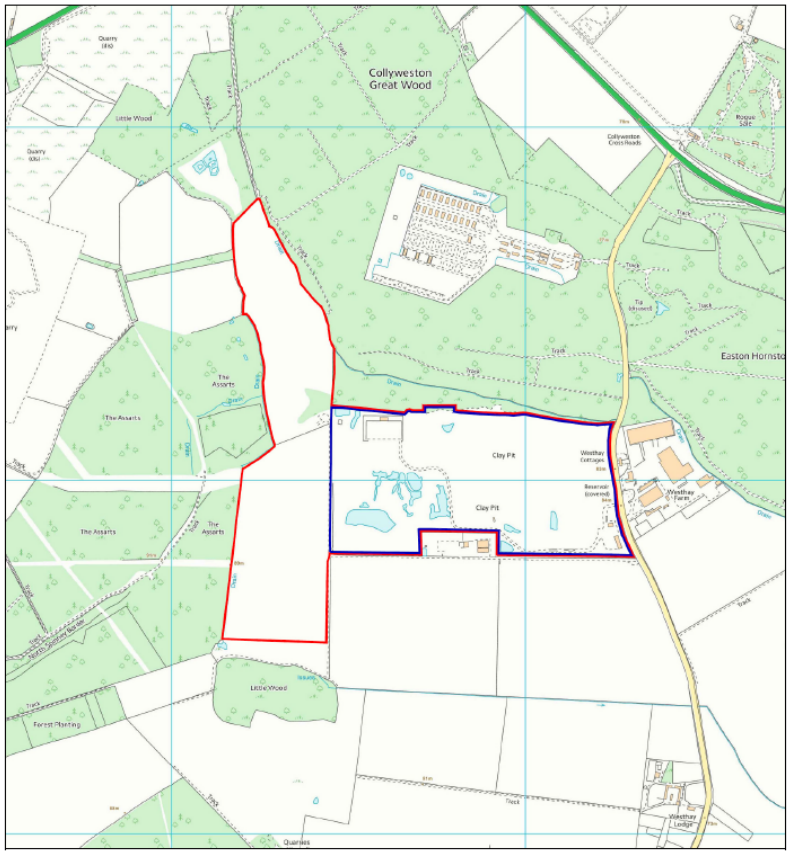
Details of Initial Consultation – NVIA Methodology

Proposed Noise Impact Assessment Methodology (3 of 4)

26.05.20

FIGURE 1

POTENTIAL WESTERN EXTENSION AREA



Boundary of the existing East Northants Resource Management Facility

Approximate boundary of the area of interest

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Proposed Noise Impact Assessment Methodology (4 of 4)

26.05.20

FIGURE 2

Noise Assessment Locations

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Consultation Response – East Northamptonshire Council

From: [redacted]@east-northamptonshire.gov.uk>
Date: 01 June 2020 12:39
To: [redacted]
Subject: FW: Potential Extension to ENRMF - Proposed Noise Impact Assessment Methodology

Dear [redacted]

Thank you for your email and the opportunity to comment on the methodology for the acoustic survey. As you clearly point out carrying an acoustic survey during Covid 19 presents a number of challenges. I have no issues with the approach you are suggesting taking into account the joint guidance issued by The Association of Noise Consultants and The Institute of Acoustics. One of the main challenges will be how to deal with uncertainties due to the unusual circumstances and would expect these to covered in some detail.

Are there any sensitive ecological receptors that need to be taken into consideration in which case you may have to consult Natural England.

I gather the acoustic survey report will be submitted in support of a planning application to extend the landfill site and would suggest, if you have not already done so, that you discuss your proposals with Northamptonshire County Council and the Environment Agency as they may have a different view.

Please call if you would like to discuss this matter further.

Regards
[redacted]

[redacted]
Senior Environmental Protection Officer
East Northamptonshire Council
Tel: 01832 742037

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Consultation Response – Environment Agency

From: [redacted]@environment-agency.gov.uk>
Date: 22 June 2020 15:36
To: [redacted]@vibrock.com>
Cc:
Subject: Noise impact assessment

Hi [redacted]

Thank you for your e-mail.
In general the noise assessment proposal seems to be acceptable.

For Environmental Permitting the Environment Agency uses the BS4142 assessment procedure and it is this assessment which will form the significant part of any submission to the EA.
Obviously we would normally prefer data from recent surveys as this gives more confidence that the data represents the current noise climate around the site.

If it is possible to monitor the current baseline then I would recommend doing so – obviously bearing in mind social distancing and staff safety etc.
I accept that the baseline would potentially be affected by reduced traffic flow, potentially leading to a reduced background level and subsequent over estimation of any site impact, however we do not know when traffic will return to pre Covid-19 levels and may possibly be reduced for a significant period of time. Baseline data obtained now would also possibly provide a reasonable worst case scenario.
Alternatively, the traffic flow may well increase in the near future depending on how Government advice on social distancing and returning to work progresses, in which case the current baseline may be closer to a representative level than the 2011 data.

Obviously if you cannot collect the data due to staff concerns regarding Covid-19 then the 2011 baseline will have to be used.

Whatever method you decide to do, you will be able to explain your reasoning and any potential uncertainties in the BS4142 report.

I hope that helps, please feel free to contact me if you need any further information.

Regards

[redacted]
Regulatory Officer
Lincolnshire & Northamptonshire - South
Tel 02030256478

Environment Agency
Nene House
Pytchley Lodge Road
Pytchley Lodge Industrial Estate
Kettering
NN15 6JQ

APPENDIX 2

Noise Management and Monitoring Scheme (2012)

NOISE MANAGEMENT AND MONITORING SCHEME

EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, STAMFORD ROAD, NORTHAMPTONSHIRE

APPENDIX ESE

IPC document reference:
WS010001/ENRMF/ESAPPESE

Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009
Regulation 5(2)(q)

Report reference: AU/KCE/SPS/1604/01
March 2012

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1. Introduction

1.1 East Northants Resource Management Facility at Stamford Road, Northamptonshire is operated by Augean South Limited. The site has been operated as a clay extraction site since 1957 and a landfill site since 2000. A soil treatment plant has been operated at the site since 2008.

1.2 The site currently operates in accordance with a number of planning consents. In accordance with the planning consents the activities at the site are carried out under the controls specified in a noise monitoring scheme approved by the planning authority. The controls specified in the approved noise monitoring scheme are set out in this document and will continue to be implemented at the site.

1.3 This scheme shall be implemented throughout the life of the operations at the site.

2. Noise management

2.1 The residential property closest to the landfill site is the row of cottages, Westhay Cottages, fronting onto Stamford Road to the north of the site entrance.

2.2 Noise levels at the Cottages are intermittently high as a result of road and air traffic movements. In 2005 Augean South Limited provided funds to P. C. Howard, the owners of the Cottages, for windows to be replaced by double-glazed units and these works were carried out. A raised landform comprising a screening bund is in place between Phase 5 of the landfill and Stamford Road.

2.3 No plant, machinery or vehicles shall be used on site unless fitted with silencers maintained in accordance with the manufacturers' recommendations and specification.

2.4 Reversing alarm sounders shall be of the non-tonal type on site equipment, such as the broad-band 'bbs-tek' marketed by Brigade Electronics[1].

2.5 Except as may otherwise be agreed in writing by the Local Planning Authority, all plant, equipment and machinery used on site, including vehicular traffic to and from the site, shall be designed and maintained to reduce noise levels to a minimum and shall be operated in accordance with manufacturers' instructions. All plant, equipment and machinery used on

[1] Brigade Electronics Plc, Kent (www.brigade-electronics.co.uk)

site, including vehicular traffic, which is capable of being fitted with the appropriate silencers, baffles, cladding and rubber linings shall be so fitted and maintained.

2.6 All landfill and earth-moving equipment shall be maintained in good order and operated in an environmentally considerate manner. Any new plant purchased or leased by Augean South Limited for use on Cell 5A works which are the closest works to Westhay Cottages shall have noise emissions among the lowest for the plant type.

3. Noise monitoring

3.1 Currently, noise monitoring is conducted at Westhay Cottages at six-monthly intervals. It is proposed that monitoring and reporting continues in the same manner except that the frequency of monitoring shall be increased to quarterly during landfilling in Cell 5A and during re-grading works in Cells 5A and 2B.

3.2 The monitoring procedure is, and will continue to be, as follows:

- A type 1 precision integrating sound level meter shall be employed and operated by a competent person. A field calibration check shall be made before and after monitoring.
- The measuring microphone shall be positioned at least 1.5 metres above ground level at Westhay Cottages. The microphone shall be approximately 5 metres from the Cottages unless or until such time as permission to enter the driveway/garden of No. 3 Westhay Cottages is withdrawn.
- Measurement shall be for a minimum period of 1 hour during normal working hours of the landfill site.
- A record shall be made of the L_{Aeq} sound level over the monitoring period(s), along with other statistical indices if helpful to the evaluation. ($L_{Aeq,\ free\text{-}field}$ stands for the notionally steady sound level, in dBA, that contains an equivalent amount of acoustic energy as the actual fluctuating

value over the specified time period, measured in a sound field free of reflections, save for the ground).

- By observation of the ambient sound level in the absence of extraneous noise such as from aircraft, Stamford Road traffic and any other sources unrelated to the landfill site, or by other means, an estimate shall be made of the site-attributable noise level, $L_{Aeq,\ free\text{-}field}$.

- Monitoring shall be conducted during suitable weather conditions, that is, in the absence of excessively high wind speeds (for example, above 5m/s at ground level); in the absence of rain or other precipitation, including fog; and at air temperatures generally not below 3°C. The meteorological conditions shall be reported.

- The results shall be reported to Augean South Limited within two working weeks of the survey with a copy sent to Northamptonshire County Council. Monitoring shall be conducted without prior notification to the site operating company.

3.3 Normally, the limit for site-attributable noise from waste management sites is set at the same value as for minerals workings because of the similarity in equipment and operating methods. The normal daytime limit recommended in MPS 2: Annex 2[2] is 55 dB $L_{Aeq,\ free\text{-}field}$ in the vicinity of the receptor(s). This limit was proposed to the Local Planning Authority by Augean South

[2] Office of the Deputy Prime Minister (ODPM). March 2005. Minerals Policy Statement 2 (MPS 2) 2005, Annex 2. Controlling and mitigating the environmental effects of minerals extraction in England.

Limited (then, Atlantic Waste Services Limited) in October 2003. The provision of double-glazing to the Westhay Cottages as a noise mitigating measure since then effectively means that the 55 dB (L_{Aeq}) limit (for routine/long term operations) no longer applies and noise at a higher level would remain acceptable.

3.4 It is proposed that during Cell 5A landfilling, the threshold noise level above which additional noise mitigation measures would be implemented shall be 65 dB ($L_{Aeq,\ free\text{-}field}$) at Westhay Cottages. This represents the value deemed acceptable for gardens and public open spaces prior to MPS 2 and aligns with the levels of noise likely to arise from waste disposal plant in Cell 5A. It is further proposed that during re-grading works over Cells 5Aand 2B, the threshold shall be 75 dB ($L_{Aeq,\ free\text{-}field}$). Both threshold values reflect the added protective sound insulation of closed double-glazing over open single-glazed windows.