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10.0 NOISE AND VIBRATION

10.1 Introduction

10.1.1 This chapter of the Environmental Statement (ES) provides an assessment of the noise and vibration impacts of the Proposed Development. The scope of the assessment is as follows:

- construction noise and vibration impacts resulting from the works to realign the eastern end of Whitefield Lane (all other construction activities are scoped out due to their scale and/ or location relative to noise sensitive receptors);
- operational noise impacts from extraction activities at the Gale Common Ash Disposal Site; and
- operational noise impacts from road traffic generated by the Proposed Development on public roads within the study area.

10.1.2 Impacts associated with the restoration of the Gale Common Ash Disposal Site are considered to be comparable to the operational noise impacts and are therefore not assessed separately. The post-restoration works have been scoped out from further assessment as the proposed post-restoration uses have no significant noise sources.

10.1.3 As the operation of the Proposed Development is roughly separated into three geographical areas of excavation (Stage II ash disposal area, Stage III ash disposal area and Lagoons C and D) (as shown on Figure 3.3 (ES Volume III)), each with different Noise Sensitive Receptors (NSRs) nearby, the on-site operational impacts for each of these areas has been assessed separately.

10.1.4 Baseline sound monitoring has been undertaken at NSRs local to the Proposed Development and at NSRs near to the designated operational traffic routes. The methodology and results of the baseline monitoring are presented in this chapter.

10.1.5 No sources of significant vibration are anticipated to be associated with the operation of the Proposed Development. Therefore, an assessment of operational vibration has been scoped out of the assessment.

10.1.6 This chapter is supported by Figure 10.1 (in ES Volume III) and the following Appendices (in ES Volume II):

- Appendix 10A: Baseline Sound Survey;
- Appendix 10B: Operational and Construction Plant Data; and
- Appendix 10C: Operational Traffic Data.

10.2 Legislation and Planning Policy Context

Legislation

Environmental Protection Act 1990

10.2.1 The Environmental Protection Act 1990 (EPA) Part 3 prescribes noise (and vibration) emitted from premises (including land) so as to be prejudicial to health or a statutory nuisance.

10.2.2 Local authorities are required to investigate any public complaints of noise and if they are satisfied that a statutory nuisance exists, or is likely to occur or recur, they may serve a noise abatement notice. A notice is served on the person responsible for the nuisance. It requires either simply the abatement of the nuisance or works to abate the nuisance to be carried out, or it prohibits or restricts the activity. Contravention of a notice without reasonable excuse is an offence.

10.2.3 In determining if a noise complaint amounts to a statutory nuisance the local authority can take account of various guidance documents and existing case law; no statutory noise limits exist.

Demonstrating the use of 'Best Practicable Means' (BPM) to minimise noise levels is an accepted defence against a noise abatement notice.

Control of Pollution Act 1974

- 10.2.4 Sections 60 and 61 of the Control of Pollution Act 1974 (CoPA) provide the main legislation regarding demolition and construction site noise and vibration. If noise complaints are received, a Section 60 notice may be issued by the local authority with instructions to cease work until specific conditions to reduce noise have been adopted.
- 10.2.5 Section 61 of CoPA provides a means for applying for prior consent to carry out noise generating activities during construction. Once prior consent has been agreed under Section 61, a Section 60 notice cannot be served provided the agreed conditions are maintained on-site.
- 10.2.6 CoPA requires that BPM (as defined in Section 72 of CoPA) be adopted for construction noise on any given site. CoPA makes reference to British Standard (BS) 5228 (British Standards Institute (BSI) 2014a and 2014b) as BPM.

Environmental Permitting Regulations 2016

- 10.2.7 The Environmental Permitting (England and Wales) Regulations 2016 require the application of Best Available Techniques (BAT) to activities performed within installations regulated by the legislation, in order to manage the impact of these operations on the surrounding environment. This therefore applies to the operational period, not construction.
- 10.2.8 In terms of noise specifically, the selection of BAT will have to be considered and balanced with releases to different environmental media (air, land and water) and to give due consideration to issues such as usage of energy and raw materials. Noise, therefore, cannot be considered in isolation from other impacts on the environment.
- 10.2.9 The definition of pollution includes "emissions which may be harmful to human health or the quality of the environment, cause offence to human senses or impair or interfere with amenities and other legitimate uses of the environment". BAT is therefore likely to be similar, in practice, to the requirements of the Statutory Nuisance legislation which requires the use of BPM to prevent or minimise noise nuisance. In the case of noise 'offence of any human senses' may be judged by the likelihood of complaints. However, the lack of complaint should not necessarily imply the absence of a noise problem. In some cases, it may be possible, and desirable, to reduce noise emissions still further at reasonable costs and this may therefore be BAT for noise emissions. Consequently, the aim of BAT should be to ensure that there is no reasonable cause for annoyance to persons beyond the installation boundary.
- 10.2.10 Guidance regarding Environmental Permitting and noise is available in the Environment Agency's Integrated Pollution Prevention and Control (IPPC) H3 document 'Horizontal Guidance for Noise Part 2 - Noise assessment and Control' (Environment Agency, 2004a). However, 'Horizontal Guidance for Noise Part 1 – Regulation and Permitting' (Environment Agency, 2004b), which provided guidance relating to noise limits from industrial installations in terms of absolute rating levels and rating levels relative to background noise levels (as defined in BS 4142:1997 (now superseded)) was withdrawn in February 2016. Therefore, industry wide noise limits no longer apply.
- 10.2.11 The Gale Common Ash Disposal Site is operated under an existing Environmental Permit (as varied) which includes a requirement to control noise.

National Policy Context

National Planning Policy Framework

- 10.2.12 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG) 2019) was first published in 2012 and revised in July 2018 and February 2019. This document sets out the Government's planning policies for England and how these are expected to be applied. The NPPF supersedes the previous guidance document Planning

Practice Guidance (PPG) 24 'Planning and Noise' (Department of Communities and Local Government, 1994).

10.2.13 The NPPF must be taken into account in the preparation of local and neighbourhood plans and is a material consideration in the determination of planning applications.

10.2.14 The NPPF states that:

"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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans..." (paragraph 170)

10.2.15 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:

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

identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason". (paragraph 180)

10.2.16 With regards to 'adverse impacts' and 'significant adverse impacts' the NPPF refers to the Noise Policy Statement for England Explanatory Note (NPSE) (Department for Environment, Food & Rural Affairs (DEFRA) 2010).

National Planning Practice Guidance

10.2.17 In March 2014, the Department for Communities and Local Government (DCLG) released its National Planning Practice Guidance (NPPG) (DCLG, 2014) web-based resource to support the NPPF. The guidance advises that local planning authorities should 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*
- *Whether or not a good standard of amenity can be achieved."*

10.2.18 This guidance introduced the additional concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level).

10.2.19 In determining if noise is a concern the factors to be considered include:

- *"The absolute noise level of the source;*
- *The existing ambient noise climate;*
- *The time of day;*
- *The frequency of occurrence;*
- *The duration; and*
- *The character of the noise and cumulative impacts."*

10.2.20 Full details of the NPPG on effects are provided in Table 10.1 below.

Table 10.1 – Planning Practice Guidance

PERCEPTION	EXAMPLES OF OUTCOMES	INCREASING EFFECT LEVEL	ACTION
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/ or attitude, 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/ or attitude, 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/ or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Noise Policy Statement for England

- 10.2.21 The NPSE seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. The NPSE applies to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise.
- 10.2.22 The NPSE sets out the long-term vision of the government's noise policy, which is to:
"promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development".
- 10.2.23 This long-term vision is supported by three aims:
*"avoid significant adverse impacts on health and quality of life;
mitigate and minimise adverse impacts on health and quality of life; and
where possible, contribute to the improvements of health and quality of life."*
- 10.2.24 The long-term policy vision and aims are designed to enable decisions to be made regarding what is an acceptable noise burden to place on society.
- 10.2.25 The 'Explanatory Note' within the NPSE provides further guidance on defining 'significant adverse effects' and 'adverse effects' using the concepts:
- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
 - Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
 - Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.
- 10.2.26 The three aims can therefore be interpreted as follows:
- the first aim is to avoid noise levels above the SOAEL;
 - the second aim considers situations where noise levels are between the LOAEL and SOAEL. In such circumstances, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur; and
 - the third aim seeks, where possible, to positively improve the health and quality of life through the pro-active management of noise whilst also taking account of the guiding principles of sustainable development. It is considered that the protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.
- 10.2.27 The NPSE recognises that it is not possible to have single objective noise-based measures that define the SOAEL, LOAEL and NOEL that are applicable to all sources of noise in all situations. The levels are likely to be different for different noise sources, receptors and at different times of the day.

Planning Practice Guidance – Minerals

- 10.2.28 Within the PPG for Minerals there is additional guidance solely relating to noise emissions associated with mineral extraction. The guidance on noise from mineral extraction largely adopts the criteria previously set out in the replaced Minerals Planning Statement (MPS) 2, Annex 2.

10.2.29 Mineral planning authorities “*should take account of the prevailing acoustic environment and in doing so consider whether or not noise from the proposed operations would:*

- *give rise to a significant adverse effect;*
- *give rise to an adverse effect; and*
- *enable a good standard of amenity to be achieved.”* (paragraph 020)

10.2.30 The guidance suggests that Minerals Planning Authorities (MPAs) should ensure that unavoidable noise emissions are controlled, mitigated or removed at source. MPAs should also establish appropriate noise limits for extraction in proximity to noise sensitive properties.

10.2.31 In line with the Explanatory Note of the NPSE, this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

Local Planning Policy

North Yorkshire County Council

10.2.32 The saved policies of the North Yorkshire County Council (NYCC) Minerals Local Plan (1997) includes Policy 4/14 ‘Local Environment and Amenity’ which states “Proposals for mining operations and the associated depositing of mineral waste will be permitted only where there *would not be an unacceptable impact on the local environment or residential amenity.*”

10.2.33 The saved policies of the NYCC Waste Local Plan (2006) includes Policy 4/18 ‘Traffic Impact’ and Policy 4/19 ‘Quality of Life’. Policy 4/18 Traffic Impact states:

“Where rail, waterway or other environmentally preferable modes of transport are not feasible, waste management facilities will only be permitted where the level of vehicle movements likely to be generated can be satisfactorily accommodated by the local highway and trunk road network and would not have an unacceptable impact on local communities.”

10.2.34 Policy 4/19 Quality of Life states

“Proposals for waste management facilities will be permitted only where there would not be an unacceptable impact on the local environment and residential amenity.”

Selby District Council Core Strategy Local Plan

10.2.35 In the Selby District Council (SDC) Core Strategy Local Plan (SDC, 2013) Section 3.5, Objective 16 is formulated in the following way:

“[The protection] against pollution, improving the quality of air, land and water resources, and avoiding over-exploitation of water resources, and preventing noise/light/soil pollution and protecting development from noise/light/soil pollution.”

10.2.36 In Policy SP19 – Design Quality within the Core Strategy it goes on to state that:

“Proposals for all new development will be expected to contribute to enhancing community cohesion by achieving high quality design and have regard to the local character, identity and context of its surroundings including historic townscapes, settlement patterns and the open countryside... Both residential and non-residential development should meet the following key requirements: ...

Preventing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water, light or noise pollution or land instability.”

Other Guidance

British Standard 7445-1:2003 and 7445-2:1991

- 10.2.37 BS 7445 ‘Description and measurement of environmental noise’ (BSi, 2003 & 1991) defines parameters, procedures and instrumentation required for noise measurement and analysis.

British Standard 5228:2009+A1:2014

- 10.2.38 BS 5228-1 ‘Code of practice for noise and vibration control on construction and open sites. Noise’ (BSi 2014a) provides a ‘best practice’ guide for noise control, and includes Sound Power Level (L_w) data for individual plant as well as a calculation method for noise from construction activities. BS 5228-2 ‘Code of practice for noise and vibration control on construction and open sites. Vibration’ (BSi, 2014b) provides comparable ‘best practice’ for vibration control, including guidance on the human response to vibration.

British Standard 4142:2014

- 10.2.39 BS 4142 ‘Methods for rating and assessing industrial and commercial sound’ (BSi, 2014a) can be used for assessing the effect of noise of an industrial nature, including mechanical services plant noise. The method compares the difference between ‘rating level’ of the industrial noise, with the ‘background level’ at the receptor position.

World Health Organisation (WHO) Guidelines for Community Noise 1999

- 10.2.40 The World Health Organisation’s (WHO) ‘Guidelines for Community Noise’ (WHO, 1999) recommend internal and external daytime and night-time environmental noise limits. Daytime outdoor limits are 55 and 50 dB $L_{Aeq,16h}$ to reduce the risk of ‘serious’ or ‘moderate’ annoyance respectively, indoors the limit is 35 dB $L_{Aeq,16h}$. Night-time limits are 45 dB $L_{Aeq,8h}$ outdoors and 30 dB $L_{Aeq,8h}$ indoors to reduce the risk of sleep disturbance.

Department of Transport: Calculation of Road Traffic Noise

- 10.2.41 Department of Transport (DfT)/ Welsh Office Memorandum ‘Calculation of Road Traffic Noise’ (CRTN) (1998) describes procedures for traffic noise calculation, and is suitable for environmental assessments of schemes where road traffic noise may have an effect.

Highways Agency: Design Manual for Road and Bridges

- 10.2.42 The Highways England ‘Design Manual for Road and Bridges Volume 11 Section 3 Part 7 HD213/11 (Revision 1) Traffic Noise and Vibration’ (DMRB) (Highways Agency, 2011) provides guidance on the appropriate level of assessment to be used when assessing the noise and vibration effects arising from all road projects, including new construction, improvements and maintenance. The DMRB guidance can also be used for assessing changes in traffic noise levels as a result of other types of projects, including the Proposed Development.

ISO 9613-2:1996: Attenuation of Sound during Propagation Outdoors

- 10.2.43 International Standards Organisation (ISO) 9613-2:1996 ‘Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation’ (ISO, 1996) specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources.

10.3 Assessment Method and Significance Criteria

Impact Assessment and Significance Criteria

- 10.3.1 Effects are classified based on the magnitude of the impact and the sensitivity or value of the affected receptor. The criteria for assigning the magnitude of impacts are outlined below for the

various potential impacts during construction and operation, and these are followed by a scale of receptor sensitivity and overall classification of effects matrix.

Assessment of Construction Noise Effects (Realignment of Whitefield Lane)

10.3.2 At this stage in the project design development (before the appointment of a construction contractor), only preliminary information on the construction activities, programme and number or type of construction plant are available. Worst-case periods in the construction of the project have therefore been identified and construction plant requirements from similar projects to the Proposed Development that AECOM have worked on have been used to determine potential impacts on nearby receptors.

10.3.3 The calculation method provided in BS 5228-1 takes account of factors including:

- the number and types of equipment operating and their associated Sound Power Levels (L_{wA});
- their modes of operation (i.e. the percentage operating-times within the working period);
- the distance to NSRs, and
- the effects of any intervening ground cover or barrier/ topographical screening.

10.3.4 The subsequent assessment of construction noise effects at residential NSRs considers the guidance in 'example method 1 – the ABC method' as defined in BS 5228-1. Table 10.2 (reproduced from BS 5228-1) provides guidance in terms of appropriate threshold values for residential NSRs, based upon existing ambient noise levels.

Table 10.2 – Construction Noise SOAEL and LOAEL for Residential Receptors

ASSESSMENT CATEGORY AND THRESHOLD VALUE PERIOD	THRESHOLD VALUE $L_{Aeq,T}$ DB(A) – FREE-FIELD		
	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
<p>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.</p> <p>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.</p> <p>NOTE 3: Applies to residential receptors only.</p>			
<p>(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.</p> <p>(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.</p> <p>(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.</p> <p>(d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.</p>			

10.3.5 For the appropriate period (day, evening, night, weekend etc.), the ambient noise level is determined and rounded to the nearest 5 dB and the appropriate 'Threshold Value' is then derived. The predicted construction noise level is then compared with this Threshold Value. Based upon this BS 5228 ABC method, the criterion adopted in this assessment for the determination of potentially significant effects is the exceedance of the $L_{Aeq,T}$ threshold level for the category appropriate to the ambient noise level at each NSR. This is considered to be potentially equivalent to the SOAEL, although as stated in BS 5228, other project-specific factors, such as the number of NSRs affected and the duration and character of the impact, are also considered by the assessor when determining if there is a potentially significant effect. With consideration of the above and the information presented in Table 10.2, Table 10.3 presents the construction noise Magnitude of Impact criteria for residential receptors.

Table 10.3 – Construction Noise Magnitude of Impact Criteria for Residential Receptors

MAGNITUDE OF IMPACT	$L_{Aeq,T}$ DB (FAÇADE)
High	Exceedance of ABC Threshold Value by ≥ 5 dB
Medium	Exceedance of ABC Threshold Value by up to 5 dB
Low	Equal to or below the ABC Threshold Value by up to 5 dB
Very low	Below the ABC Threshold Value by ≥ 5 dB

10.3.6 The criterion for the LOAEL for this assessment is a predicted construction noise level equal to the existing ambient noise level at each NSR, *i.e.* resulting in a 3 dB increase in noise level when combined with the ambient noise level. Note that these criteria relate to residential NSRs only, in line with the ABC method.

Assessment of Daytime Construction Works Traffic on the Public Highway

10.3.7 It is expected that no significant numbers of construction traffic will be produced by the Proposed Development construction works, including the realignment of Whitefield Lane. Therefore, further assessment of construction traffic noise is excluded from the assessment scope. For more information please refer to Chapter 8: Traffic and Transport.

Assessment of Construction Vibration

10.3.8 Given the nature of the construction works no significant levels of vibration are expected to be produced by the construction plant. The exception to this may be concrete breaking that may be required if the concrete structure (associated with an existing agricultural groundwater borehole adjacent in the vicinity of the proposed realignment of Whitefield Lane) is required. However, as the distance from the concrete structure to the nearest NSR is approximately 75 m the possibility of vibration impacts are negligible. Therefore, further assessment of construction vibration is excluded from the assessment scope.

Assessment of Operational Noise

10.3.9 Noise modelling has been carried out using CadnaA noise modelling software (version 2018). The model has been used to calculate operational noise levels to a representative set of off-site sensitive receptors using the ISO 9613-2 methodology.

10.3.10 The PPG on mineral extraction suggests that development proposals should undertake a noise emissions assessment, to include identification of all sources of noise and, for each source, consider the proposed operating locations, procedures, schedules and duration of work for the life of the operation. It goes on to state that the:

“proposals for the control or mitigation of noise emissions should:

consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties and sensitive environmental sites;

assess the existing acoustic environment around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;

estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;

identify proposals to minimise, mitigate or remove noise emissions at source; and

monitor the resulting noise to check compliance with any proposed or imposed conditions.”

10.3.11 The guidance sets out noise level criteria to be achieved by mineral extraction operations and these are detailed as follows:

“MPAs 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 10 dB during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10 dB 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 55 dB $L_{Aeq,1h}$ (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 10 dB and should not exceed 55 dB $L_{Aeq,1h}$ (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 42 dB $L_{Aeq,1h}$ (free field) at a noise sensitive property.

Where the site noise has a significant tonal element, it may be appropriate to set specific limits to control this aspect. Peak or impulsive noise, which may include some reversing beepers, may also require separate limits that are independent of background noise (e.g. L_{max} in specific octave or third-octave frequency bands, and that should not be allowed to occur regularly at night).

Care should be taken, however, to avoid any of these suggested values being implemented as fixed thresholds as specific circumstances may justify some small variation being allowed.

Increased temporary daytime noise limits of up to 70 dB $L_{Aeq,1h}$ (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 $L_{Aeq,1h}$ (free field) limit referred to above should be regarded as the normal maximum.”

10.3.12 The daytime criteria for typical site operations are based on the guidance set out in the PPG on mineral extraction, whereby a lower daytime noise limit is identified as the background level plus 10 dB, with an upper noise limit of 55 dB $L_{Aeq,1h}$. In Table 10.4 an impact of low magnitude has in turn been defined where the lower noise limit is predicted to be exceeded, and an impact of medium magnitude where the upper limit is exceeded. An impact of high magnitude has been defined as where a level of 70 dB $L_{Aeq,1h}$ is exceeded.

10.3.13 The PPG on mineral extraction is interpreted as requiring that evening noise does not exceed the background sound level by plus 10 dB or 55 dB $L_{Aeq,1h}$, whichever is the lower. In Table 10.4 an impact of medium magnitude has therefore been defined where this limit is predicted to be

exceeded. An impact of high magnitude has been defined as where a level of 55 dB $L_{Aeq,1h}$ is exceeded.

- 10.3.14 The PPG on mineral extraction advises that during the night, site noise levels should not exceed an absolute level of 42 dB $L_{Aeq,1h}$. The PPG on mineral extraction does not set out any limits relative to the background level; although BS 4142:2014 advises that a difference between background levels and operational noise levels of +5 dB is 'likely to be indication of an adverse impact'. In Table 10.4 an impact of high magnitude has in turn been defined where the background level plus 5 dB is predicted to be exceeded, and an impact of medium magnitude where the 42 dB $L_{Aeq,1h}$ limit is exceeded. An impact of high magnitude has been defined as where WHO 'Guidelines for Community Noise' (1999) guidance for external noise levels outside of bedrooms of 45 dB L_{Aeq} is exceeded.

Table 10.4 – Operational Noise Magnitude of Impact Criteria for Residential Receptors

MAGNITUDE OF IMPACT	OPERATIONAL NOISE LEVEL (X) $L_{Aeq,T}$ DB (FREE-FIELD)		
	Daytime	Evening	Night-time
High	$x > 70$	$x > 55$	$x > 45$
Medium	$55 < x \leq 70$	$L_{A90} + 10 < x \leq 55$	$42 < x \leq 45$
Low	$L_{A90} + 10 < x \leq 55$	$x \leq L_{A90} + 10$ and ≤ 55	$L_{A90} + 5 \leq x \leq 42$
Very low	$x \leq L_{A90} + 10$ and ≤ 55	N/A	$x < L_{A90} + 5$ and < 42

- 10.3.15 The criterion for impacts of low magnitude is considered to equate to the LOAEL. The criterion for impacts of medium magnitude is considered to equate to that for the SOAEL.
- 10.3.16 As the extraction operations will be in three separate parts of the Site, three variations of the operational noise model have been produced to predict the worst-case noise emissions at NSRs for each area of extraction.
- 10.3.17 Owing to the nature of the proposed extraction works, the topography of the Gale Common Ash Disposal Site will substantially change over the operational period. The expected topography towards the end of extraction from each area (when excavation activity will be occurring closest to the operational boundary) and the excavation plant that will be operating has been included in the noise model. This is considered to be worst-case given the shorter distances between the mobile plant and NSRs.
- 10.3.18 No specific works are anticipated to be required to create bunds around working areas as these will be created by the method of working (extracting from the middle of each area outwards behind a retained bund of material). Therefore the increased temporary noise limits discussed in the guidance are not required or considered further in this assessment.

Assessment of Operational Changes in Road Traffic Noise

- 10.3.19 The Proposed Development will require Heavy Goods Vehicles (HGVs) to export the extracted material. As stated in Chapter 8: Traffic and Transport, the majority of HGV traffic coming into the Gale Common Ash Disposal Site will travel from the M62 onto the A19 at Junction 34. From the A19 traffic will turn onto Whitefield Lane, Whitley and head westbound to the Gale Common Ash Disposal Site. Part of this preferred route along the A19 and Whitefield Lane is located within the village of Whitley, as such traffic will travel near to residential properties and has the potential to result in changes to road traffic noise emissions experienced at NSRs.
- 10.3.20 The criteria for the assessment of traffic noise changes arising from operational have been taken from Table 3.1 of DMRB and are provided in Table 10.5 below.

Table 10.5 – Traffic Noise Criteria

MAGNITUDE OF IMPACT	CHANGE IN TRAFFIC NOISE LEVEL $L_{A10,18H}$ DB
High	≥ 5
Medium	3 to <5
Low	1 to <3
Very low	<1

10.3.21 DMRB advises that an increase in road traffic flows of 25% (where the traffic speed and composition remain consistent) equates to an increase in road traffic noise of 1 dB L_{A10} . A doubling in traffic flow would be required for an increase in 3 dB L_{A10} .

10.3.22 It is generally accepted that changes in noise levels of 1 dB or less are imperceptible, and changes of 1 to 3 dB are not widely perceptible. Consequently, at the selected road traffic noise receptors the magnitude of the predicted change in noise levels uses the scale shown in

10.3.23 Table 10.5 above with respect to operational traffic. The criteria are based on the current guidance on short-term changes in traffic noise levels in DMRB. The SOAEL is set at a change in traffic noise of +3 dB LA10 and the LOAEL at +1 dB LA10.

Significance Criteria

10.3.24 Effects are classified based on the magnitude of the impact and the sensitivity or value of the affected receptor. The criteria for assigning the magnitude of impacts are outlined for the various potential impacts during construction and operation of the Proposed Development as described above.

Receptor Sensitivity

10.3.25 In accordance with the principles of Environmental Impact Assessment, the sensitivity of existing receptors to noise (or vibration) impacts (during either the construction or operational phases of the Proposed Development) has been defined in Table 10.6.

Table 10.6 – Sensitivity/ Value of Receptors

SENSITIVITY/ VALUE OF RESOURCE/ RECEPTOR	DESCRIPTION	EXAMPLES OF RECEPTOR USAGE
Very high	Receptors where noise or vibration will significantly affect the function of a receptor	Auditoria/ studios Specialist medical/ teaching centres, or laboratories with highly sensitive equipment
High	Receptors where people or operations are particularly susceptible to noise or vibration. Sensitive ecological receptors known to be vulnerable to the effects of noise or vibration.	Residential Quiet outdoor areas used for recreation Conference facilities Schools/ educational facilities in the daytime Hospitals/ residential care homes Libraries Ecologically sensitive areas for example Special Protection Areas (SPAs)
Medium	Receptors moderately sensitive to noise or vibration where it may cause some distraction or disturbance	Offices Restaurants/ retail Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf)
Low	Receptors where distraction or disturbance of people from noise or vibration is minimal	Residences and other buildings not occupied during working hours Factories and working environments with existing high noise levels Sports grounds when spectator or noise is a normal part of the event

10.3.26 The following terminology has been used in the assessment to define effects:

- adverse – detrimental or negative effects to an environmental resource or receptor;
- neutral – effects to an environmental resource or receptor that are neither adverse nor beneficial; or
- beneficial – advantageous or positive effects to an environmental resource or receptor.

10.3.27 The effect resulting from each individual potential impact type above is classified according to the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix presented in Table 10.7 below, but where necessary also considering the context of the acoustic environment.

Table 10.7 – Classification of Effects

SENSITIVITY/ VALUE OF RESOURCE/ RECEPTOR	MAGNITUDE OF IMPACT			
	High	Medium	Low	Very low
Very high	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

10.3.28 For the purposes of this assessment, negligible and minor effects are considered to be not significant, whereas moderate and major effects are considered to be significant.

10.3.29 In accordance with the NPPF (DCLG, 2019) and NPSE (Defra, 2010), it is important to identify NSRs that exceed the LOAEL and ensure adverse effects are mitigated and minimised. The assessment carried out and presented in this chapter focuses on the impact at existing residential NSRs.

Consultation

10.3.30 Table 10.8 summarises the consultation responses of relevance to noise and vibration received throughout the preparation of the Environmental Statement.

Table 10.8 – Consultation Summary

CONSULTEE	DATE (METHOD OF CONSULTATION)	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE / HOW COMMENTS HAVE BEEN ADDRESSED
Local Resident 1	11 th December 2018 Email	The local resident agreed to have baseline noise monitoring equipment set up at their property in January 2019.	The local resident was contacted to arrange a specific date and time to set up and collect the noise monitoring equipment.

CONSULTEE	DATE (METHOD OF CONSULTATION)	SUMMARY OF CONSULTEE COMMENTS	SUMMARY OF RESPONSE / HOW COMMENTS HAVE BEEN ADDRESSED
Local Resident 2	14 th December 2018 Email	The local resident agreed to have baseline noise monitoring equipment set up at their property in January 2019.	The local resident was contacted to arrange a specific date and time to set up and collect the noise monitoring equipment.
Local Resident 3	16 th December 2018 Email	The local resident agreed to have baseline noise monitoring equipment set up at their property in January 2019.	The local resident was contacted to arrange a specific date and time to set up and collect the noise monitoring equipment.
Selby District Council Environmental Health Officer (EHO)	19 th December 2018 Email	The EHO stated they were unable to comment in any detail about the proposed long-term monitoring locations as they were not aware of where operations will be taking place on the Gale Common Ash Disposal Site. The EHO was satisfied with the short-term measurement locations for monitoring road traffic noise.	A response was issued on 20 th December 2018 which provided additional information regarding the areas of operation on the Gale Common Ash Disposal Site. Long term noise monitoring was subsequently undertaken at the agreed locations. Short term noise monitoring was undertaken at the agreed locations.

10.4 Baseline Conditions

Extent of Study Area

- 10.4.1 The extent of the study area has been defined to include the nearest receptors/ communities in each direction from the Site and alongside the transport corridors that may be affected by changes in road traffic flows during the construction phase of the Proposed Development (the study area). Representative NSRs within this study area in all directions from the Site have been included within the assessment to ensure all effects are appropriately considered.
- 10.4.2 Key NSR locations have been selected which are considered to be representative of the nearest and potentially most sensitive existing receptors to the Site. It is considered that if noise (and vibration) levels are suitably controlled at the key receptors identified, then noise (and vibration) levels would be suitably controlled at other sensitive receptors in the surrounding area.
- 10.4.3 Details of the nearest NSRs, the shortest distance to the Proposed Development and location reference have been included in Table 10.9 below.

Table 10.9 – List of Key Receptors and Distances Between NSR And Proposed Development

NOISE SENSITIVE RECEPTOR (NSR)	SHORTEST APPROXIMATE DISTANCE FROM RED LINE BOUNDARY OF PROPOSED DEVELOPMENT
Grange Farm (Residential) (NSR 1)	240 m from southern boundary of the Gale Common Ash Disposal Site
Grange Meadows (Residential) (NSR 2)	60 m from western boundary of Gale Common Ash Disposal Site
Residential properties near to junction of Whitefield Lane and Selby Road (NSRs 3, 4 and 5)	15 m north of Whitefield Lane in the vicinity of the proposed realignment

Baseline Sound Surveys

- 10.4.4 Full details of the baseline surveys including monitoring locations, survey instrumentation, existing noise climate and meteorological conditions can be found within Appendix 10A (ES Volume II). Details of the baseline sound monitoring locations and the NSR they are representative of are presented in Table 10.9 below.
- 10.4.5 An initial survey was completed in January 2019 with Long-Term (LT) monitoring locations selected to inform the operational assessment and Short-Term (ST) measurements in the vicinity of Whitefield Lane to inform the operational road traffic noise model. A second survey was conducted in April 2019 to inform the construction assessment.

Table 10.10 – Baseline Sound Monitoring Locations

LOCATION ID/ NSR	DATE	DETAILS
LT1/ NSR1 – Grange Meadows	Wednesday 2 nd to Wednesday 9 th January 2019	Long-term monitoring location situated at a property off Cobcroft Lane, near to the “Wonkey Donkey” sanctuary. The microphone was located along the drive to the property, attached to a wooden fence using a tripod.
LT2/ NSR2 – Grange Farm		Long-term monitoring location situated at the back of Haigh Farm near the tennis courts. The microphone was attached to a metal fence using a tripod.
LT3/ NSR3 – 10 Whitefield Lane	Thursday 11 th to Tuesday 16 th April 2019	Long-term monitoring location situated along Whitefield Lane. The microphone was located in the front garden of the property, along with a weather station and attached to a wooden fence using a tripod.

LOCATION ID/ NSR	DATE	DETAILS
LT4/ NSR4 – Whitley House		Long-term monitoring location situated along Selby Road (A19) and opposite Whitefield Lane junction. The microphone was located in the front garden of the property, attached to a tree using a tripod.
LT5/ NSR5 – Grasmere Bungalow		Long-term monitoring location situated along Selby Road (A19). The microphone was located in the back garden of the property, attached to a garden trellis using a tripod.
ST1 – 2 Whitefield Villas	Wednesday 2 nd January 2019	Short-term monitoring location situated outside 2 Whitefield Villas. The microphone was placed 3.7 m from the curb edge.
ST2 – 5 Whitefield Lane		Short-term monitoring location situated outside 5 Whitefield Lane. The microphone was placed approximately 1 m from the façade.
ST3 – Opposite 2 Church Row		Short-term monitoring location situated opposite 2 Church Row along Selby Road. The microphone was placed approximately 4 m from the curb edge.

Key:

LT = long term monitoring location

ST = short term monitoring location

Representative Sound Levels

- 10.4.6 Representative baseline sound levels have been established at each of the monitoring locations. For the LT measurements the representative day, evening and night-time levels have been derived through review of all 15-minute interval results throughout the relevant periods in the survey. For the ST measurements, $L_{A10,18hr}$ values have been derived from the short-term measurements by using the standard correction method defined in CRTN ($L_{A10,3hr} - 1$ dB).
- 10.4.7 Table 10.11 and Table 10.12 below summarise the representative ambient (L_{Aeq}) and background (L_{AF90}) sound levels at the long-term monitoring locations measured during the two surveys as these are the criteria referenced in the guidance relevant to the construction and operational noise assessments. The $L_{A10,18h}$ parameter is presented for the ST measurements as required for the assessment of road traffic noise impacts according to DMRB.

Table 10.11 – Representative existing ambient and background sound levels - January 2019 survey

RECEPTOR	LT1	LT2	ST1	ST2	ST3
Daytime L_{Aeq} dB (07:00-19:00)	54	46	-	-	-
Daytime L_{A90} dB (07:00-19:00)	51	39	-	-	-
Evening L_{Aeq} dB (19:00-22:00)	50	39	-	-	-
Evening L_{A90} dB (19:00-22:00)	46	35	-	-	-
Night-time L_{Aeq} dB (22:00-07:00)	48	39	-	-	-
Night-time L_{A90} dB (22:00-07:00)	42	34	-	-	-
Daytime $L_{A10, 18\text{ hour}}$ (06:00 – 00:00)	-	-	76	57	76

Table 10.12 – Representative existing ambient sound levels - April 2019 survey

RECEPTOR	LT3	LT4	LT5
Daytime L_{Aeq} dB (07:00-19:00)	65	62	53
Evening (19:00 – 23:00) and Weekend L_{Aeq} dB	61	59	51
Night-time L_{Aeq} dB (23:00-07:00)	56	56	49

- 10.4.8 In Table 10.11 the evening period refers to 19:00 – 22:00 hours, whereas in Table 10.10 the evening period is 19:00 – 23:00. This is so the representative sound levels directly correspond to the different evening assessment periods defined in PPG – Minerals and BS 5228-1 (BSI, 2014a).
- 10.4.9 The long-term results presented in Table 10.11 and Table 10.12 have been used to inform the operational and construction noise assessments respectively. The short-term measurements presented in Table 10.9 have been used for reference when creating the operational road traffic noise model for the Proposed Development.

Future Baseline

10.4.10 In the absence of the Proposed Development, future baseline sound levels at NSRs will depend largely on traffic flows on the surrounding road network. This assessment of on-site operations has assumed that the baseline levels will not increase in order to give a worst-case assessment (i.e. assume a greater change) of the potential impact of the Proposed Development.

10.5 Development Design and Impact Avoidance

Construction Works Associated with the Realignment of Whitefield Lane

10.5.1 The eastern end of Whitefield Lane is proposed to be realigned to move road traffic further away from residential properties on Whitefield Lane. Although these works are proposed in order to mitigate operational traffic noise impacts on these residents, there is potential for noise to be generated during the associated construction works.

10.5.2 Construction activities are likely to be undertaken typically during weekday daytime and Saturday mornings. Measures to mitigate noise will be implemented during the construction phase (approximately 6 months) in order to minimise impacts at local residential NSRs.

10.5.3 The appointed contractor(s) will be required to implement the following mitigation measures (and more as necessary):

- abiding by construction noise limits at nearby NSRs and monitoring of baseline and ongoing noise levels during construction;
- implementing processes to minimise noise before works begin and ensuring that BPM are being achieved throughout the construction period (approximately 6 months), including the use of localised screening around significant noise producing plant and activities where appropriate;
- ensuring that modern plant is used, complying with the latest European noise emission requirements. Selection of inherently quiet plant where possible;
- all plant and equipment being used for the works to be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched off when not in use;
- ensuring contractors are made familiar with current legislation and the guidance in BS 5228 which should form a prerequisite of their appointment;
- loading and unloading of vehicles, dismantling of site equipment or moving equipment or materials around the Site to be conducted in such a manner as to minimise noise generation;
- consultation with NYCC and SDC and local residents as appropriate to advise of potential noisy works that are due to take place; and
- monitoring of any noise complaints, and reporting to the contractor for immediate investigation.

10.5.4 Method statements regarding construction management, traffic management, and overall site management will be prepared in accordance with best practice and relevant British Standards, to help minimise impacts of the construction works at Whitefield Lane. One of the key aims of such method statements will be to minimise noise disruption to local residents during these construction works.

10.5.5 Consultation and communication with the local community throughout the construction works at Whitefield Lane will also serve to publicise the works schedule, giving notification to residents regarding periods when higher levels of noise may occur during specific operations, and providing lines of communication where complaints can be addressed.

10.5.6 A detailed construction noise and vibration assessment may be required once the contractor(s) is appointed and if change to the construction methods assumed within this assessment is expected, then a review of the construction assessment may be required depending on the significance of the change.

10.5.7 In addition, it is anticipated that the appointed contractor would be a member of the 'Considerate Constructors Scheme' which is an initiative open to all contractors undertaking building work.

On-site Operations

10.5.8 The Proposed Development will be operated in accordance with the existing Environmental Permit (as varied) for the Gale Common Ash Disposal Site, issued and regulated by the Environment Agency.

10.5.9 Extraction activities will take place behind a retained bund of material where practicable and where works are close to NSRs.

10.5.10 All mobile plant used on site will be fitted with white noise reversing alarms (as opposed to beeping alarms).

Operational Traffic

10.5.11 The additional operational traffic flows have been identified as a potentially significant noise source which could result in significant effects at NSRs located on the A19/ Selby Road and Whitefield Lane. Therefore, it is proposed to realign the eastern end of Whitefield Lane so it is positioned further away from the nearest NSRs in order to mitigate potential amenity and noise impacts from vehicles.

10.5.12 The trigger for the realignment works being implemented is based on road traffic noise calculations, which concluded that significant adverse noise effects would be likely for some NSRs due to HGV traffic associated with PFA export beyond approximately 400,000 tonnes per annum using the existing road. Further details of the proposed works are provided in Chapter 4: The Proposed Development.

10.5.13 In addition to moving the road further from NSRs on Whitefield Lane, a close-boarded fence and hedgerow will also be installed between the new Whitefield Lane road alignment and the NSRs, providing additional noise attenuation.

10.6 Likely Impacts and Effects

Sources of Information/ Data

10.6.1 The following sources of information that define the Proposed Development have been reviewed and form the basis of the assessment of likely significant effects of noise and vibration:

- indicative drawings of the Gale Common Ash Disposal Site layout and locations of proposed mobile and stationary plant;
- schedule of proposed plant (see Appendix 10B (ES Volume II));
- construction and operational plant noise data either referenced from previous similar projects, BS 5228 or manufacturers' specifications;
- Ordnance Survey mapping of the Site and surrounding area; and
- aerial photography.

Construction Works Associated with Realignment of Whitefield Lane

10.6.2 This section discusses the potential noise impacts on NSRs arising during the construction works to realign the eastern end of Whitefield Lane.

10.6.3 Noise levels experienced by local receptors during such works depend upon a number of variables, the most significant of which are:

- the noise generated by plant or equipment used on site, generally expressed as Sound Power Levels (L_w) or the vibration generated by the plant;
- the periods of use of the plant on site, known as its on-time;
- the distance between the noise/ vibration source and the receptor;
- the noise attenuation due to ground absorption, air absorption and barrier effects;
- the reflection of noise due to the presence of hard surfaces such as the sides of buildings; and
- the time of day or night the works are undertaken.

10.6.4 The entire site preparation and construction programme for the realignment of Whitefield Lane is anticipated to take approximately 6 months from commencement to completion. It is anticipated that the majority of construction works will be undertaken during the period Monday to Friday 07:00 to 19:00 and Saturday 07:00 to 13:00.

Construction Noise Emission Criteria

10.6.5 Based upon the analysis and summary of the results of the existing free-field baseline ambient noise surveys undertaken (excluding those periods when noise levels were elevated and not deemed representative), Table 10.13 sets out the BS 5228 'ABC' noise threshold categories at each monitoring location in the vicinity of each NSR for the time periods as set out in Table 10.2.

10.6.6 The proposed construction works are in the vicinity of NSRs 3, 4 and 5, which are considered representative of all residential properties in the vicinity. Therefore the construction noise assessment has considered impacts solely on these NSRs. Impacts upon all other residential properties in proximity will be similar to those identified. Effects at all other NSRs identified in this assessment will be not significant due to their distance from the works.

Table 10.13 – Measured Free-Field $L_{Aeq,T}$ Noise Levels and Associated 'ABC' Assessment Category

RECEPTOR	WEEKDAY DAYTIME 07:00 – 19:00		WEEKDAY EVENING 19:00 – 23:00		NIGHT 23:00 – 07:00		SATURDAY 07:00 – 13:00		SATURDAY 13:00 – 23:00		SUNDAY 07:00 – 23:00	
	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC
NSR3	66	B	58	B	56	C	62	A	61	B	62	B
NSR4	62	A	58	B	56	C	61	A	60	B	60	B
NSR5	53	A	49	A	49	B	52	A	50	A	52	A

Construction noise limits have been derived for each NSR in

10.6.7 Table 10.14 using the BS5228 ABC methodology (described in Table 10.2).

Table 10.14 – Construction Noise Limits

RECEPTOR	CONSTRUCTION NOISE LIMIT $L_{AEQ,T}$ DB (FREE-FIELD)					
	Weekday daytime 07:00 – 19:00	Weekday evening 19:00 – 23:00	Night 23:00 – 07:00	Saturday 07:00 – 13:00	Saturday 13:00 – 23:00	Sunday 07:00 – 23:00
NSR3	70	60	55	65	60	60
NSR4	65	60	55	65	60	60
NSR5	65	55	50	65	55	55

Construction Noise Emissions

- 10.6.8 At this early stage of design for the realignment of Whitefield Lane, a construction contractor has not yet been appointed and, as such, it has not been possible to calculate construction noise emissions based upon a known list of construction plant. Therefore, predicted noise levels for construction works have been based upon construction methods used for other road schemes in the UK and based on professional experience gained on such projects. As a conservative approach, it is assumed that all plant and activities are taking place along the nearest perimeter of the Site to the NSRs.
- 10.6.9 The construction assessment has been divided into three notable phases of construction each of which has been assessed separately:
- ground clearance;
 - road construction; and
 - breakout of concrete (if required).
- 10.6.10 The predicted levels apply to normal weekday daytime (07:00 – 19:00) working, although they could approximate to other time periods where working at the same rate and intensity is proposed. Full details on the noise prediction methodology, including a full list of construction plant and associated sound power levels for each construction phase, are presented in Appendix 10B (ES Volume II).
- 10.6.11 A summary of predicted noise levels at NSR locations around Whitefield Lane (using the closest NSR to the proposed works in the vicinity of the baseline noise surveys) are presented in Table 10.15. Free-field noise levels have been predicted to allow subsequent comparison with the ABC categories derived from free-field baseline ambient noise levels at NSRs.

Table 10.15 – Construction Noise Predictions for the Proposed Whitefield Lane Realignment

RECEPTOR	PREDICTED FREE-FIELD NOISE LEVEL FOR DAYTIME CONSTRUCTION ACTIVITY $DB L_{AEQ,12H}$		
	Site Clearance	Road Construction	Concrete Breakout
NSR3	63	64	68
NSR4	68	66	57
NSR5	68	63	56

Construction Noise Effects

10.6.12 The effects of the predicted daytime construction noise levels (as presented in Table 10.15) have been classified by considering the daytime ABC noise limit values in Table 10.2, using the semantic scales in Table 10.3 and 10.6. These effects are summarised in Table 10.16.

Table 10.16 – Daytime construction noise effects (potentially significant effects underlined)

RECEPTOR	SIGNIFICANCE OF EFFECT		
	Site Clearance	Road Construction	Concrete Breakout
NSR3	Minor	Minor	Minor
NSR4	Moderate	Moderate	Negligible
NSR5	Moderate	Minor	Negligible

10.6.13 Construction noise effects at all receptors throughout the different phases of construction of the Whitefield Lane Realignment are predicted to be **negligible (not significant) to moderate adverse (significant)** during the daytime period. The predicted noise levels are currently expected to exceed the LOAEL criteria during at least one phase of the construction at each of the NSRs.

10.6.14 Potential measures to ensure that appropriate mitigation is in place during the works have already been discussed in Section 10.5. However, in order to reduce any moderate adverse (significant) impacts additional mitigation is discussed in Section 10.7.

10.6.15 The identified impacts assume that construction activity for the Whitefield Lane Realignment works is of sufficient duration to result in a significant effect. As per the guidance in BS 5228-1, where construction activities are of particularly short duration, the resultant noise effects may not be as significant as initially identified. For example, site clearance is typically a relatively short-term activity near any particular NSR.

Gale Common Ash Disposal Site Extraction Operations

10.6.16 The operational noise assessment has identified absolute sound level criteria that have to be achieved at the identified NSRs. Using representative background sound levels presented above and guidance contained within PPG – Minerals (see paragraph 10.3.11), appropriate operational noise criteria levels are presented in Table 10.17.

Table 10.17 – Operational Noise Criteria

TIME PERIOD	CRITERIA	NSR1 / LT1	NSR2 / LT2
Daytime (07:00-19:00 hrs)	+10 dB > Background (L_{A90}) or 55 dB $L_{Aeq, 1hr}$	55 dB $L_{Aeq, 1hr}$	49 (55)* dB $L_{Aeq, 1hr}$
Evening (19:00-22:00 hrs)	+10 dB > Background (L_{A90}) and 55 dB $L_{Aeq, 1hr}$	55 dB $L_{Aeq, 1hr}$	45 dB $L_{Aeq, 1hr}$
Night-time (22:00-07:00 hrs)	42 dB $L_{Aeq, 1hr}$	42 dB $L_{Aeq, 1hr}$	39 (42)* dB $L_{Aeq, 1hr}$

*Denotes absolute operational criteria

10.6.17 The predicted free-field operational sound levels at the NSRs around the Proposed Development are presented in Table 10.18. The results presented are the highest predicted at any NSR within the vicinity of each monitoring location. Assuming continual 24-hr operation, the predicted noise

levels could apply to any assessment period. Worst-case operational noise levels for each area of extraction have been predicted accordingly.

Table 10.18 – Predicted Worst-Case Operational Noise Levels for Each Area of Extraction

RECEPTOR	STAGE OF EXTRACTION	PREDICTED OPERATIONAL SOUND LEVEL $L_{Aeq,T}$ DB
NSR1 – Grange Meadows (west)	Stage II	40
	Stage III	39
	Lagoons C&D	50
NSR2 – Grange Farm (south)	Stage II	41
	Stage III	29
	Lagoons C&D	31

10.6.18 The daytime operational assessments for receptors NSR1 and NSR2 are presented in Table 10.19. In addition, the magnitude of impact and effect classification has been included based upon the assessment outcomes, with reference to the semantic scales presented in Section 10.3 above and the operational noise criteria in Table 10.17.

Table 10.19 – Daytime Operational Assessment

RECEPTOR	NSR1			NSR2		
	Stage II	Stage III	Lagoons C&D	Stage II	Stage III	Lagoons C&D
Predicted Sound Level L_{Aeq} , dB	40	39	50	41	29	31
Operational Noise Criterion $L_{Aeq,1h}$ dB	55	55	55	49 (55)	49 (55)	49 (55)
Excess of predicted sound level over criterion, dB	-15	-16	-5	-8	-20	-18
Magnitude of impact (assigned from Table 10.3)	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Significance of effect (assigned from Table 10.6)	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse
<u>Uncertainty:</u> This assessment is based upon the assumed plant requirements, based on discussions with operational staff at the Gale Common Ash Disposal Site. The location of all on-site plant has been estimated based upon information currently available						

RECEPTOR	NSR1			NSR2		
Stage of Extraction	Stage II	Stage III	Lagoons C&D	Stage II	Stage III	Lagoons C&D
and assumes a realistic worst-case. The position of plant will move throughout the excavation period which will result in variations in the distances between plant and NSRs and in turn the resulting noise levels; however the plant is not anticipated to get any closer to NSRs than assumed in this assessment.						

10.6.19 The evening and night-time assessments for receptors NSR1 and NSR2 are presented in Table 10.20 and 10.20.

Table 10.20 – Evening Operational Assessment

RECEPTOR	NSR1			NSR2		
Stage of Extraction	Stage II	Stage III	Lagoons C&D	Stage II	Stage III	Lagoons C&D
Predicted Sound Level L_{Aeq} , dB	40	39	50	41	29	31
Operational Noise Criterion $L_{Aeq,1h}$ dB	55	55	55	45	45	45
Excess of predicted sound level over criterion, dB	-15	-16	-5	-4	-16	-14
Magnitude of impact	Low	Low	Low	Low	Low	Low
Significance of effect	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Minor adverse
<u>Uncertainty:</u> Same as above						

Table 10.21 – Night-time operational assessment

RECEPTOR	NSR1			NSR2		
	Stage II	Stage III	Lagoons C&D	Stage II	Stage III	Lagoons C&D
Predicted Sound Level L_{Aeq} , dB	40	39	50	41	29	31
Operational Noise Criteria $L_{Aeq,1h}$ dB	42	42	42	39 (42)	39 (42)	39 (42)
Excess of predicted sound level over criterion, dB	-2	-3	+8	-1	-13	-11
Magnitude of impact	Low	Low	High	Low	Very Low	Very Low
Significance of effect	Minor adverse	Minor adverse	Major adverse	Minor adverse	Negligible adverse	Negligible adverse
<u>Uncertainty:</u> Same as above						

- 10.6.20 Operational noise levels have been assessed at the two NSRs for each of the three phases of operation (day time, evening and night-time periods). During the daytime, the predicted significance of effect is **negligible (not significant)** at NSR1 and NSR2. In the evening period (19:00 – 22:00) both NSR1 and NSR2 are predicted to experience effects of **minor adverse (not significant)** significance for extraction is all areas.
- 10.6.21 During the night-time (22:00 – 07:00) the predicted effect significance at NSR1 is predicted to be **minor adverse (not significant)** for Stage II and Stage III extraction. However, for the C&D Lagoons operational phase a **major adverse (significant)** effect is predicted at NSR1. At NSR2, an effect between **negligible** and **minor adverse (not significant)** is predicted for extraction in all areas.
- 10.6.22 It should be noted that the operational predictions assume worst-case (highest noise emission) operations at the Gale Common Ash Disposal Site. As such, the modelled scenarios will only be truly representative of the on-site operations for a relatively short period of the Proposed Development's operation, whilst activity is taking place at the closest extraction location to the NSR.
- 10.6.23 With regards to the above, operational impacts through the daytime and evening periods are predicted to result in a significance of effect no greater than minor adverse (not significant) at either NSR1 or NSR2. Therefore, no further mitigation is considered necessary for operations within these time periods. If extraction activities were to be undertaken during the night-time period (22:00 – 07:00) a major (significant) effect is predicted at NSR1 during extraction from Lagoons C&D, but mitigation is identified in Section 10.7, meaning that no residual effects are identified.

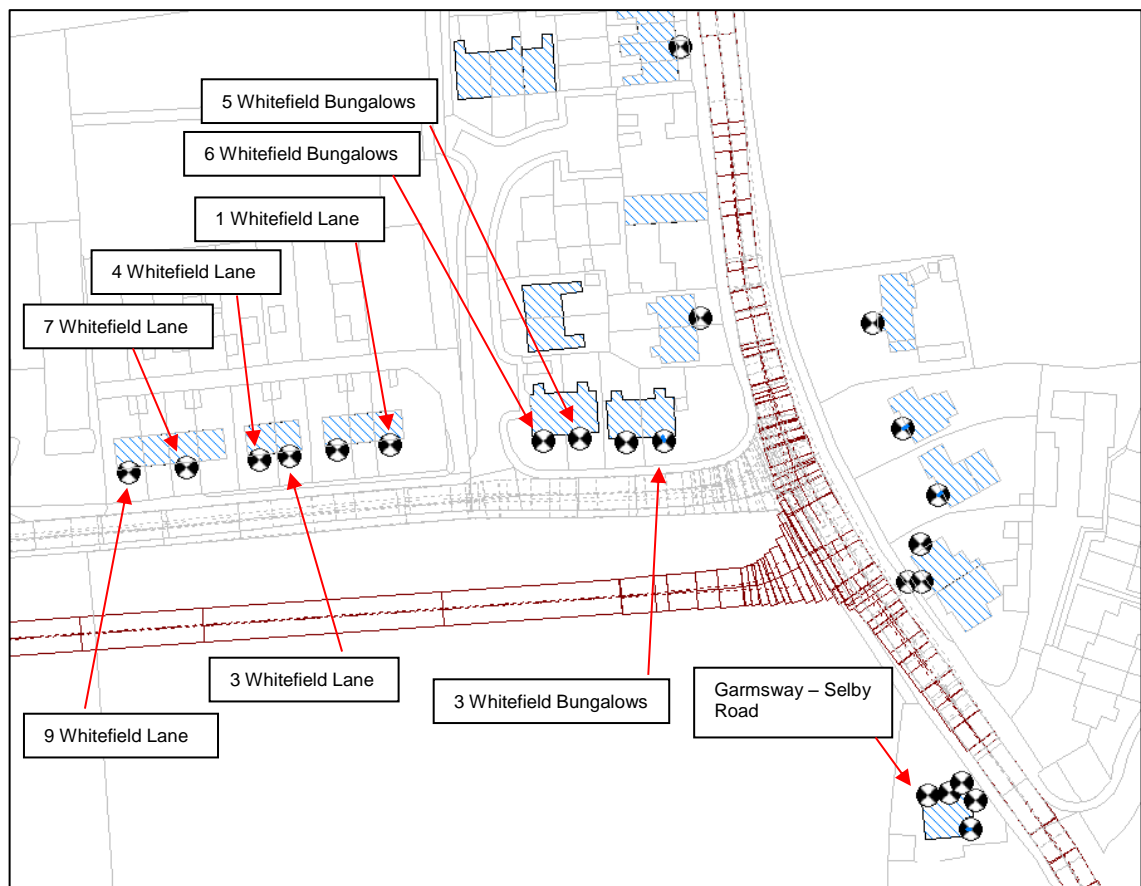
Operational Road Traffic

10.6.24 Operational traffic will access the Gale Common Ash Disposal Site from the M62 Junction 34, south down Selby Road (A19) and turning onto Whitefield Lane. It is the aim of this assessment to determine the relative change in noise emissions between the 2020 Base traffic flows and the 2020 Base + Proposed Development Traffic. Committed developments have been excluded from all scenarios so the impact of development traffic can be specifically assessed and will also act as a 'worst-case' scenario. As discussed in Section 10.5, two road alignment scenarios exist that are assessed:

- No Change to road alignment – to determine the operational flows that are at a level sufficient to trigger a significant effect along the existing road network; and
- Whitefield Lane Realignment – once operational flows are above the level where a significant effect is predicted on the No Change road alignment, assessment of operational traffic on the realigned network up to the maximum ash extraction 1 million tpa.

10.6.25 The operational traffic impact has been predicted using the 3-dimensional noise modelling software (CadnaA). The software applies the prediction methodology in the CRTN. The traffic data used within the noise models have been provided from the Transport Assessment (see Chapter 8: Traffic and Transport) and are presented in Appendix 10C (ES Volume II). The assessment locations have been selected as they have been identified as the NSRs worst-affected by operational road traffic. The assessment locations are all located at 1 m from NSR facades, are illustrated on Plate 10.1 below.

Plate 10.1: Operational Road Traffic Assessment Locations



10.6.26 Table 10.22 presents the calculated relative changes in noise levels at NSRs for the change in road traffic noise level for the No Change to road alignment scenario. With respect to road surfacing, a correction of -1 dB has been applied, in accordance with CRTN, for all roads with average speeds of < 75 kph. For the roads with average speeds > 75 kph (M62) a standard surface correction of -3.5 dB has been applied. As explained in Section 10.3 an impact is considered medium or higher (resulting in a significant effect) when a noise change equal to or greater than 3 dB is predicted.

Table 10.22 – Assessment of operational traffic noise impacts with No Change to road alignment

NSR	RELATIVE CHANGE TO NOISE LEVELS AT NOISE SENSITIVE RECEPTORS (DB)			
	Base vs Base + 400k tpa	Base vs Base + 410k tpa	Base vs Base + 420k tpa	Base vs Base + 430k tpa
Garmsway - Selby	0.9	0.9	0.9	1
3 Whitefield Bungalows	1.6	1.6	1.6	1.7
4 Whitefield Bungalows	2.2	2.2	2.2	2.3
5 Whitefield Bungalows	2	2	2	2.1
6 Whitefield Bungalows	2.3	2.3	2.3	2.5
1 Whitefield Lane Ground Floor	2.7	2.7	2.7	2.9
3 Whitefield Lane Ground Floor	2.8	2.8	2.8	3
4 Whitefield Lane Ground Floor	2.7	2.8	2.8	3
5 Whitefield Lane Ground Floor	2.8	2.8	2.8	3
7 Whitefield Lane Ground Floor	2.9	2.9	2.9	3.1
9 Whitefield Lane Ground Floor	2.8	2.9	2.9	3.1
1 Whitefield Lane First Floor	2.6	2.7	2.7	2.9
3 Whitefield Lane First Floor	2.7	2.7	2.7	3
4 Whitefield Lane First Floor	2.8	2.8	2.8	3.1
5 Whitefield Lane First Floor	2.8	2.9	2.9	3.1
7 Whitefield Lane First Floor	2.9	2.9	2.9	3.1
9 Whitefield Lane First Floor	2.9	2.9	2.9	3.1

10.6.27 Table 10.22 above indicates that traffic noise level changes greater than 3 dB are predicted at residential NSRs on Whitefield Lane once operational flows associated with ash extraction above 420,000 tpa occur. This would suggest that operational flows equal to or below 420,000 tpa would result in either a low or very low magnitude of impact which equates to either a **minor adverse or negligible effect (not significant)**. Conversely, it is predicted traffic associated with ash extraction above 420,000 tpa would result in significant effects at NSRs. Therefore, to avoid significant operational traffic noise effects at NSRs, realignment of Whitefield Lane will be necessary before exports reach 430,000 tpa. The draft Section 106 Agreement submitted with the Application would secure that a programme for the realignment of Whitefield Lane is submitted to the minerals planning authority when commercial contracts for the supply of over

400,000 tpa are entered into – this allows a period in which the works can be designed, and for a programme to be set for their implementation in accordance with the ramping up of PFA export.

10.6.28 Table 10.23 presents the calculated relative changes in noise levels at NSRs between the Base 2020 traffic flows with No Change to realignment and the maximum operational traffic flows (extraction of 1 million tpa) once the Whitefield Lane Realignment has been completed to identify the potential worst-case effects.

Table 10.23 – Assessment of operational traffic noise impacts with Whitefield Lane Realignment

NSR	RELATIVE CHANGE TO NOISE LEVELS AT NOISE SENSITIVE RECEPTORS (DB)
Garmsway - Selby	0.7
3 Whitefield Bungalows	0.7
4 Whitefield Bungalows	0.2
5 Whitefield Bungalows	0.3
6 Whitefield Bungalows	0
1 Whitefield Lane	0.2
3 Whitefield Lane	0.2
4 Whitefield Lane	0.1
5 Whitefield Lane	0.2
7 Whitefield Lane	0.5
9 Whitefield Lane	0.9
1 Whitefield Lane First Floor	0.1
3 Whitefield Lane First Floor	0.1
4 Whitefield Lane First Floor	0.2
5 Whitefield Lane First Floor	0.2
7 Whitefield Lane First Floor	0.3
9 Whitefield Lane First Floor	0.5

10.6.29

10.6.30 Table 10.23 indicates that, with the realignment of Whitefield Lane in place, the Proposed Development operating at 1 million tpa extraction would result in an increase in noise levels at NSRs no greater than 1 dB. This equates to a very low impact and negligible significance of effect. Therefore, no additional mitigation is considered necessary.

10.6.31 Chapter 8: Traffic and Transport reports on two ‘sensitivity tests’ which were undertaken as part of the transport assessment whereby up to 20% of traffic uses alternative routes to the strategic road network – turning left onto Cobcroft Lane and either north up Sudforth Lane or west onto Stubbs Lane and Leys Road. Basic Noise Level (BNL) calculations have been undertaken to determine the operational road traffic impact on these roads. However, as traffic flows are <1,000 AAWT,18hr (which is below the threshold for the BNL calculation method) the Noise

Advisory Council (NAC) (1978) low flow traffic calculation method has also been considered. In both instances, the predicted change to noise levels would result in a low impact which equates to a **minor adverse** noise effect (**not significant**). Therefore, no additional assessment is considered necessary.

10.7 Mitigation and Enhancement

Construction Works Associated with Realignment of Whitefield Lane

- 10.7.1 The preferred approach for controlling construction noise and vibration is to reduce levels at source where possible, but with due regard to practicality. Sometimes a greater noise or vibration level may be acceptable if the overall construction time, and therefore length of disruption, is reduced.
- 10.7.2 The list of noise control measures presented within Section 10.5 provides a detailed, but not exhaustive list of construction noise and vibration management measures that will be considered by the appointed Contractor(s).
- 10.7.3 In order to reduce noise levels, at NSR4 and NSR5 during the site clearance and road construction aspects of construction, erection of imperforate hoarding around the eastern and northern perimeter of the construction site for the Whitefield Lane realignment works will be undertaken. The hoarding will be of an appropriate height to partially break line of sight, therefore according to the BS 5228-1:2009+A1:2014 calculation method, this would reduce noise levels by 5 dB. This would reduce noise emissions to result in a **minor adverse (not significant)** effect. However, any mitigation design will be revisited once a construction contractor is in place and more information regarding the construction processes is known.

Gale Common Ash Disposal Site Extraction Operations

- 10.7.4 The Proposed Development will operate between 05:00 – 07:00 hours, part of the 'night-time' period for noise assessment. Due to the potential for significant adverse effects during extraction at Lagoons C and D during this period at NSR1, excavation activities will not commence until 07:00 at the earliest during work in this area, thus avoiding this potential significant adverse effect.

10.8 Limitations or Difficulties

Construction Works Associated with Realignment of Whitefield Lane

Detailed construction information is not yet available (because a contractor not yet been appointed) and therefore this assessment draws upon the experience and assessments undertaken for other similar projects. The assessment is therefore indicative, but is considered to be robust as it is based on a 'worst case'. Construction noise thresholds (limit values) have been provided in

- 10.8.1 Table 10.14 based upon existing ambient sound levels at NSRs. The mitigation measures detailed above, which will be secured by a planning condition, will help to ensure that construction noise and vibration effects are minimised and further assessment is proposed once the contractor(s) is appointed to ensure that appropriate mitigation is developed to achieve the limit values. .

Gale Common Ash Disposal Site Extraction Operations

- 10.8.2 The operational noise assessment uncertainties are detailed in Table 10.19. However, it is considered that the assumptions made mean that a 'worst case' assessment has been undertaken. Further assessment at the detailed design stage would ensure that appropriate noise limits are achieved at sensitive receptors.

10.9 Residual Effects and Conclusions

- 10.9.1 A summary of the residual effects, assuming the implementation of all appropriate mitigation to reduce noise during the construction works to realign Whitefield Lane and operational phases of the Proposed Development, is presented in Table 10.24. The classification of the residual effects after mitigation are 'not significant'.

Table 10.24 – Summary of Significant Effects

DEVELOPMENT STAGE	ENVIRONMENTAL EFFECT	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND P/ T AND D/ IN)
Construction	Noise effects during construction of the Whitefield Lane Road realignment	Up to moderate adverse at nearest residential NSRs during daytime (significant).	Further detailed assessment and implementation of noise controls by contractor, including installation of hoarding.	Minor adverse or less, on the basis that BS 5228 ABC noise limits will be met (not significant).	St, T, D
Operation	Operation of the Proposed Development	Negligible to major adverse – night-time (significant).	Operating hours during excavation of Lagoons C&D Lagoon will avoid the 'night time' period between 05:00 and 07:00.	Minor adverse/ negligible effects (not significant)	Lt, T, D

10.10 References

- British Standards Institute (2003) *BS 7445-1 – Description and measurement of environmental noise. Guide to quantities and procedures.*
- British Standards Institute (2014a) *BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1: Noise.*
- British Standards Institute (2014b) *BS 5228-2:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 2:Vibration.*
- Environment Agency (2004a) *Environmental permitting: H3 part 2 noise assessment and control.*
- Environment Agency (2004b) *Horizontal Guidance for Noise Part 1 – Regulation and Permitting.*
- Ministry of Housing, Communities and local Government (2019) *National Planning Policy Framework.*
- Department for Communities and Local Government (2014) *Planning Practice Guidance.*
- Department for Communities and Local Government (1994) *Planning Policy Guidance 24: Planning and Noise.*
- Department for Environment, Food and Rural Affairs (2010) *Noise Policy Statement for England (NPSE)*
- Department of Transport/ Welsh Office (1998) *Calculation of Road Traffic Noise (CRTN)*
- Highways Agency (2011) *Design Manual for Road and Bridges Volume 11 Section 3 Part 7 HD213/11 (Revision 1) Traffic Noise and Vibration.*
- International Standards Organisation (1996) *ISO 9613 Acoustics - Attenuation of sound during propagation outdoors.*
- The Noise Advisory Council (1978). *A guide to measurement and prediction of the equivalent continuous sound level Leq.* HMSO, London.
- North Yorkshire County Council (1997) *North Yorkshire Minerals Local Plan, adopted 1997*
- North Yorkshire County Council (2006) *North Yorkshire Waste Local Plan, adopted 2006*
- Planning Inspectorate (2012) *Advice Note Nine: Rochdale Envelope.*
- Selby District Council (2013) *Selby District Council Core Strategy Local Plan, adopted October 2013.*
- World Health Organisation (WHO) (1999) *Guidelines for Community Noise.*