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ACOUSTIC CONSULTANTS

Ref **5427-1**

For **Mead Construction Ltd**
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Wilbraham Chalk Pit
Completion of Chalk Extraction, Waste Processing, Landfilling and Quarry Restoration
Noise Impact Assessment

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WBM

WBM (the trading name of Walker Beak Mason Limited) is an established independent acoustic consultancy specialising in architectural & building acoustics, environmental noise, planning issues and expert work. WBM is a member of the Association of Noise Consultants and is also a Corporate Member of the Institute of Environmental Management & Assessment. The consultants are members of the Institute of Acoustics.

Document Control

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-	Draft for Client Review	09/02/2024	SL	RS
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Contents

1 Introduction

Mead Construction Ltd (Mead) are submitting an application to the Environment Agency for a permit for their site at Wilbraham Chalk Pit.

Planning permission was granted by Cambridgeshire County Council on 07 May 2024 (Ref No CCC/22/057/FUL) for continued mineral extraction and progressive landfilling with inert waste, temporary use of land for bulking as well as wet and dry processing of inert and non-hazardous soils and hardcore using a crusher, screener and wash plant.

This report sets out the calculated noise levels arising from the operation of the site for use in a BS 4142:2014+A1:2019 assessment at the nearest dwellings to the site.

This report is a revised version of the original report (dated February 2024) submitted with the planning application but with the site noise levels recalculated using SoundPLAN noise modelling software. SoundPLAN uses the calculation methodology set out in ISO9613-2, which has been specifically requested by the Environment Agency in this case.

To aid comprehension, a glossary of acoustic terms is presented in Appendix A.

Plans of the site, including the proposed recycling operations, and noise monitoring locations are provided in Appendix B.

The details and results of noise surveys conducted by WBM in January 2024 are provided in Appendix C.

The full breakdown of the BS 4142:2014+A1:2019 assessment is included as Appendix D.

The assumptions included in the creation of the SoundPLAN noise model for the calculations are detailed in Appendix E.

SoundPLAN noise calculation plots presenting the calculated noise levels from the site are presented in Appendix F.

2 Site Description

Wilbraham Chalk Pit has a long and established history of chalk extraction. It is located in a predominantly rural area, with the nearest residential areas located approximately 5km to the west (Fulbourn), 3km to the north-west (Great Wilbraham), 2.5km to the north-east (Six Mile Bottom) and approximately 5km to the south east (West Wratting and Balsham). Isolated dwellings are located around the site with the closest being to the south-west of the site within approximately 500m of the site entrance.

Whilst the setting is predominantly rural the site is adjacent to Camgrain, a grain storage and drying facility with 24/7 operations. Wadlow Wind Farm is located to the south-east of the site and Great Wilbraham Solar Farm is located to the north of the site.

The main source of background and ambient noise in the area is road traffic from the A11, which runs to the south-west round to the north-west of the site.

2.1 Site Operation

The site has historical permissions for chalk extraction and infilling. The application approved by Cambridgeshire County Council on 07 May 2024 (Ref No CCC/22/057/FUL) consolidates all operations on site (existing and proposed) into one planning permission, with the following works:

- Continued chalk extraction;
- Continued infilling of the chalk pit void with inert waste;
- Construction of a soils processing and washing facility;
- Restoration of the site to the agreed levels.

The proposed timetable of works means that some of these processes will occur simultaneously. A proposed timetable was set out in the Landscape and Visual Appraisal (Richard Morrish Associates Ltd, January 2024) submitted with the planning application and is reproduced below:

"3.10 Construction Process: Space for the washing facility at the southern edge of the chalk pit is essentially prepared and available. Once up and running the facility could process the existing material stockpiled in the north-west quadrant of the site in a few months. Recycled material will be sold off-site whilst the remaining material will continue to be used in the landfilling process commenced in 2023 in the north-east quadrant of the chalk pit. The following timetable is envisaged:

Year 1-2:

- *Establish washing facility*
- *Reprocessing of stored material in the north-west quadrant*
- *Establish finished contours to the western and north-western boundaries and set new hedge and woodland shelterbelt planting.*
- *Continue land filling in north-east quadrant*
- *Continue chalk extraction in south-east quadrant.*

Year 3-15:

- *Continue land filling process in a clockwise direction around the chalk pit.*
- *As finished contours are reached complete landscape restoration works.*
- *Comple and finalise the chalk extraction process.*
- *Continue receiving/processing inert waste in the southern part of the quarry until such time as the landfilling can be completed.*

Year 16-30:

- *Complete the landfill operation.*
- *Complete landscape restoration.*
- *Establish a landscape management plan with goal of achieving optimal landscape and biodiversity benefits."*

The site's permitted operating hours are:

- Monday to Friday – 07:00 – 18:00
- Saturday 07:00 – 13:00

3 Guidance

For this application the Environment Agency require a noise impact assessment conducted in line with the requirements of British Standard (BS) 4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*". The information to be reported, as specified in Section 12 of BS 4142:2014+A1:2019, is set out in full (where relevant) in Appendix D.

The information that must be submitted to the Environment Agency in a noise impact assessment that uses computer modelling or spreadsheet calculations is provided in GOV.UK Guidance "*Noise impact assessments involving calculations or modelling*" and "*Guidance – Noise and vibration management: environmental permits*". The information requested in the document "*Noise impact assessments involving calculations or modelling*" is provided in Appendix E.

The Environment Agency generally require the overall site noise and BS 4142:2014+A1:2019 rating level to be no more than 5 dB above the representative background sound level, although this is dependent on context. Additional guidance on the use of BS 4142:2014+A1:2019 when applying for a permit is provided in the Environment Agency "*Method implementation document (MID) for BS 4142*" last updated in December 2023.

The methods outlined in BS 4142:2014+A1:2019 are appropriate for the noise assessment of the proposed operations including HGV movements within the site. The assessment does not cover noise from HGV movements outside the application/site boundary.

3.1 British Standard 4142:2014+A1:2019

British Standard (BS) 4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*" describes methods for assessing the likely effects of sound of an industrial and/or commercial nature on residential properties. It includes the assessment of sound from industrial and manufacturing processes, M&E plant and equipment, loading and unloading of goods and materials, and mobile plant/vehicles on the site. It can be used to assess sound from proposed, new, modified or additional industrial / commercial sources, at existing or new premises used for residential purposes.

The standard describes methods to measure and determine ambient, background and residual sound levels, and the rating levels of industrial / commercial sound.

BS 4142:2014+A1:2019 is not intended to be used for the derivation or assessment of internal sound levels, or for the assessment of non-industrial / commercial sources such as recreational activities, motorsport, music and entertainment, shooting grounds, construction and demolition, domestic animals, people, and public address systems for speech.

Ambient sound is defined in BS 4142: 2014+A1:2019 as "*totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far*". It comprises the residual sound and the specific sound when present.

Residual sound is defined in BS 4142: 2014+A1:2019 as "*ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound*".

The background sound level is the $L_{A90,T}$ of the residual sound level, and is the underlying level of sound. Measurements of background sound level should be undertaken at the assessment location where possible or at a comparable location.

The measurement time interval should be sufficient to obtain a representative value (normally not less than 15 minutes) and the monitoring duration should reflect the range of background sound levels across the assessment period. The background sound level used for the assessment should be representative of the period being assessed.

The specific sound level is the $L_{Aeq,Tr}$ of the sound source being assessed over the reference time interval, T_r. BS 4142:2014+A1:2019 advises that T_r should be 1 hour during the day and 15 minutes at night.

The rating level is the specific sound level plus any adjustment for the characteristics of the sound (tone, impulse, intermittent or other acoustic feature).

The standard describes subjective and objective methods to establish the appropriate adjustment. The adjustments for the different features and assessment methods are summarised in the table below.

Acoustic Feature	Adjustment for Acoustic Feature		
	Subjective Methods	**Objective Methods**	
Tonality	+2 dB if just perceptible +4 dB if clearly perceptible +6 dB if highly perceptible	Third Octave Analysis	Narrow Band Analysis
		+6 dB if tones identified	Sliding scale of 0 to +6 dB depending on audibility of tone
Impulsivity	+3 dB if just perceptible +6 dB if clearly perceptible +9 dB if highly perceptible	Sliding scale of 0 to +9 dB depending on prominence of impulsive sound	
Intermittency	+ 3 dB if intermittency is readily distinctive	n/a	
Other	+ 3 dB if neither tonal nor impulsive, but otherwise readily distinctive	n/a	

Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant, it might be appropriate to apply a single correction. The rating level is equal to the specific sound level if there are no features present.

The level of impact is assessed by comparing the rating level of the specific sound source with the background sound level. Other factors that may require consideration include the absolute level of sound, the character and level of the residual sound compared to the specific sound, and the sensitivity of the receptor and scope for mitigation.

When the rating level is above the background sound level, a difference of around +5 dB is likely to indicate an adverse impact and a difference of around +10 dB or more is likely to indicate a significant adverse impact, depending on the context.

The lower the rating level with respect to the background sound level, the less likely it is that the specific sound source will have an 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.

4 Noise Surveys

4.1 Historical Data (July 2021)

Background sound levels were historically measured in the area in connection with a separate application at the site to cover a waste recycling and transfer station. The findings of the survey were presented in a MAS Environmental Ltd report dated July 2021. It was found that background sound levels varied largely depending on the wind direction with northerly winds increasing propagation of road traffic noise towards the monitoring location (representative of the nearest dwellings to the site) and increasing background sound levels. Lower background sound levels were found during periods with southerly wind directions.

A summary of the measured background sound levels presented in the MAS Environmental Ltd report is reproduced in Table 4.1 below.

Table 4.1 – Summary of Measured Background Sound Levels (dB $L_{A90,1hour}$) 06:00 – 20:00 from MAS Environmental Ltd Report (July 2021).

	Weather	Hour beginning (24 hour clock) and dB LA90,1 hour														
		06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
15/06/21 Tue	S / Fair	No data						39	38	38	38	36	36	36	36	36
16/06/21 Wed	SW / Fair	39	40	38	37	39	38	38	39	41	41	42	41	36	34	34
17/06/21 Thu	ENE&NNW / Rain	36	42	53	51	53	53	51	51	51	52	52	52	50	48	48
18/06/21 Fri	NNE / Rain	52	54	54	55	55	55	55	55	55	55	56	57	56	54	52
19/06/21 Sat	ENE & SE / Fair	47	49	50	49	51	50	50	49	49	48	47	45	44	43	45
20/06/21 Sun	N / Rain	41	45	47	49	49	50	52	51	49	50	51	51	50	50	48
21/06/21 Mon	NE/Some rain	52	53	53	51	52	53	53	53	52	53	53	53	52	50	49
22/06/21 Tue	NNE / Fair	53	54	53	53	52	52	52	53	53	52	53	50	48	46	44
23/06/21 Wed	NNE / Fair	47	45	43	44	44	43	43	43	47	48	47	48	46	37	35
24/06/21 Thu	WNW&WSW / Fair	44	44	45	43	44	48	47	48	48	48	48	48	47	46	44
25/06/21 Fri	WNW / Fair	47	50	49	50	53	52	52	53	52	53	51	52	No data		

Excluding days where rainfall was noted, the modal average background sound level between 0700 and 1800 (when the site would be operating) is 48dB L_{A90}. Notwithstanding this average value, the MAS Environmental Ltd assessment took a conservative approach using a typical lower background sound level of 43-44dB L_{A90} based on the lower range of values measured under a northerly wind direction.

4.2 Updated Data (January 2024)

Whilst a comprehensive background sound level survey was undertaken in July 2021, further sample measurements of background and ambient sound were undertaken on two separate days in January 2024 to support the current application and ascertain whether there has been any material change in the local sound environment. Background sound levels were measured on Thursday 4th January 2024 between approximately 10:00 and 13:00 and Tuesday 9th January 2024 between approximately 10:20 and 12:15.

The measurements were taken during the middle part of the day and therefore avoided the 'rush hour' periods during which one might expect higher background sound levels due to increased road traffic flows.

On Thursday 4th January, the measurements were undertaken under south-westerly wind conditions, which is representative of when the typically lower values of background sound levels were measured historically, but is also representative of conditions when the nearest residential dwellings would be largely upwind of the site.

On Tuesday 9th January 2023, the measurements were undertaken under easterly wind conditions (an east north-easterly wind direction). Whilst typically lower background sound levels were measured historically under southerly wind conditions, an easterly wind direction places the nearest residential dwellings upwind of the A11 and should ordinarily result in lower background sound levels (south-easterly being the key wind direction to be upwind of the A11). In easterly wind conditions the dwellings would be crosswind from the site and in northerly wind conditions the dwellings would be downwind from the site.

Measurements were undertaken in a free field location on the access road to the nearest dwellings, opposite the entrance to Valley Farm Cottage. A plan showing the measurement location is provided in Appendix B. The full survey details and results are presented in Appendix C.

4.3 Results

A summary of the daytime measured noise levels is presented in Table 4.2 below.

With regards to BS 4142: 2014+A1:2019 terminology, as during both surveys the site was only operational to a minimal extent and was not audible at the monitoring location the ambient and residual sound levels are the same.

Table 4.2 – Summary of Measured Noise Levels January 2024

Thursday 4 January 2024 (SW wind)		**Tuesday 9 January 2024 (ENE wind)**	
Ambient / Residual Sound Level dB $L_{Aeq,T}$	**Background Sound Level dB $L_{A90,T}$**	**Ambient / Residual Sound Level dB $L_{Aeq,T}$**	**Background Sound Level dB $L_{A90,T}$**
49 (47-50)	45 (44-48)	53 (51-57)	49 (48-51)
T=15 minutes			
Note: The arithmetic average of the 15 minute L_{A90} values is provided and the logarithmic average of the 15 minute L_{Aeq} values is provided. The range of measured values is presented in brackets			

The results of the measurements in January 2024 are consistent with the data from the previous background sound survey undertaken in 2021.

Based on the results of the 2021 and 2024 surveys, for the purposes of this assessment a lower representative background sound level of 43-44dB $L_{A90,T}$ has been considered in accordance with the previous assessment for the site, but a typical background sound level of 48dB $L_{A90,T}$ is also considered based on the modal average of the historic results and typical background sound levels measured in 2024.

5 Calculated Noise Levels

5.1 Noise Calculation Methodology

The 'equivalent continuous noise level', $L_{Aeq,\ T}$, is the preferred unit for assessing noise sources. It is the value of a continuous level that would have equivalent energy to the continuously varying noise over the specified period "T". This unit is recommended internationally for the description of environmental noise and is in general use. It is the chosen unit for describing the specific sound level in BS 4142: 2014+A1:2019, for calculation of site noise levels in BS 5228 for the control of noise on construction and open sites; and BS 7445 for the description and measurement of environmental noise.

The noise levels likely to arise at dwellings depend on the method of working and the sound power levels of the plant chosen to work a site as much as on the distance to the properties and the effects of intervening ground or any localised screening effects. Proper allowance can be made for these variables in order to calculate site noise levels.

BS 4142: 2014+A1:2019 states that where possible, determination of the specific sound level should be based on measurements, but where this is not possible (for example where the sources are not yet operating) it can be determined by calculation alone. BS 4142: 2014+A1:2019 does not contain details of noise prediction methods and at the request of the Environment Agency, the calculations in this report were undertaken using SoundPLAN noise mapping software, which uses the ISO9613-2 algorithm for the calculation of industrial noise.

5.2 Noise Calculation Assumptions

A site plan showing the quarry area, the phases of the infilling operations and the restoration of the site as well as the processing / washing facility (wet and dry recycling areas) is provided in Appendix B.

Chalk will continue to be extracted from the quarry area using a tractor and harrowing discs. The chalk is moved in the quarry area using a loading shovel (tidying material at the quarry faces). This working is seasonal, typically occurring between Easter and the end of September. For approximately two months during the harvest period, an excavator and screener will be located within the quarry area to process material and load lorries (loading also taking place within the quarry area).

During the first couple of years of the proposed site timetable, the soils stored in Phase 1 will be screened in the Phase 1 area of the site before being processed at the wash facility. Once Phase 1 is restored, the mobile plant will be relocated to the dry recycling area and the material received at the site will be processed in the wet (wash facility) and dry recycling areas. Material that cannot be recycled will be used as infill.

Infilling of Phase 2 of the site will continue as it has done previously and will take place concurrently with chalk extraction and restoration operations in Phase 1 as well as the receiving and processing of inert waste in the wet and dry recycling areas. Infilling of the void requires use of a vibrating padfoot roller to create a lining. This operation occurs infrequently (around every 2m height difference, used for around 2 hours for 1 day every 2 months).

The sound power levels of the machinery to be used on site are based primarily on manufacturers' data and supplemented with typical measurements of such plant items which are contained on the WBM plant noise database. Some items of plant that are currently in use on site were measured in situ and were presented in the MAS Environmental Ltd report dated July 2021.

For the infilling operations, the use of the vibrating padfoot roller is used independently (in isolation) from other infilling operations. As such, this source would not operate at the same time as the other sources associated with infilling. The sound power level for the roller has not been included in the calculations as the combined sound power level of the other infilling operations is higher. Thus, the worst case scenario for infilling operations is considered in the calculations.

Site noise calculations have been undertaken using SoundPLAN noise mapping software. A digital ground model (DGM) was created using local ground heights to cover the area including both the site and the nearest residential properties in the vicinity of the site. The existing and proposed ground contours on site are based on topographical data provided by Mead and as shown on the plans in Appendix B. The soil washing plant and recycling facility was confirmed by Mead to be constructed on a ground level of approximately 38m AOD.

The plant items used in the calculations are listed in Table E.1 and Table E.2 in Appendix E. These tables include the operational on-times and source heights used in the calculations. As the permitted site operations fall within the daytime period defined in BS 4142: 2014+A1:2019 the assessment period (T) is 1 hour and the percentage on-time given in the tables refers to the percentage of the 1 hour assessment period that the specific item of plant / machinery would be expected to be in operation.

To represent a typical worst case scenario, fixed plant is generally assumed to operate for 100% of the assessment period. The HGV movements associated with the operations are taken from the Transport Statement (provided by Richard Jackson Engineering Consultants, dated January 2024).

One loading shovel will serve both the wet and dry recycling areas, with a second loading shovel located in the quarry base when needed. A dump truck will be used for movement of material both between the wet and dry recycling areas and between the wet recycling area and the infill area. A dust suppression system is to be used when crushing / screening in the dry recycling area, this typically operates for 30 minutes in an hour period (i.e. 50% on time).

During Phase 1 it is assumed that the soil screener currently in use on site and as measured / presented in the MAS July 2021 report will be used on the soil heap. During Phase 2 when the dry recycling area is established WBM have used the manufacturers' information provided by Mead Construction Ltd for the screener to be used in this area.

The sound power level for the wash plant is based on information provided to WBM by Mead Construction Ltd from the manufacturer stating a measured level of 40-55dB(A) at 10m.

The full details of the assumptions used in the noise mapping are provided in Appendix E. The SoundPLAN daytime noise contour plots covering the assessment area are provided in Appendix F.

6 Noise Assessment

The contribution from each significant specific noise source has been evaluated separately and then combined together to give the overall site noise level.

The methods outlined in BS 4142:2014+A1:2019 are appropriate for the noise assessment of the site operations including HGV movements within the site. The assessment does not cover noise from HGV movements outside the application/site boundary as this is not appropriate.

As use of the vibrating padfoot roller is an infrequent activity that does not occur at the same time as infilling works, this element of site operations is not included in the assessment with the noisier infilling elements considered to represent a 'worst case scenario'.

Calculated site noise levels are provided below for different scenarios focusing on Phases 1 and 2, when the highest noise levels are likely to be generated due to the number of noise sources potentially operating simultaneously. The total site noise level is provided as well as the site noise level for the different operations on site to provide additional context. Each scenario is considered over a 1 hour assessment period. The following scenarios are calculated and presented below:

- Scenario 1 – Phase 1 (Year 1-2) – unscreened works on soil heap

  Recycling: HGV movements
  Screener, excavator and dust suppression on soil heap
  Dump truck moving soil from mound to wash plant
  Wash plant, loading shovel and screener on concrete pad

  Extraction: Tractor and harrowing discs, loading shovel, screener and excavator

  Infilling: HGV movements (including those associated with quarry)
  Tipping of infill, dozer
  Dump truck moving material from wash plant to infill area

The calculations for this scenario include some screening from the existing topography of the soil heap, based on the topographical data provided to WBM and shown in the plan in Appendix B.

- Scenario 2 – Phase 2 (Year 3-15) – infilling at top of finished level

  Recycling: HGV movements
  Screener or crusher, excavator and dust suppression in dry recycling area
  Loading shovel working between loading bays (dry recycling) and wash plant (wet recycling)
  Dump truck moving material between dry and wet recycling areas
  Wash plant and screener on concrete pad

  Extraction: Tractor and harrowing discs, loading shovel, screener and excavator

  Infilling: HGV movements (including those associated with quarry)
  Tipping of infill and dozer at finished ground heights
  Dump truck moving material from wash plant to infill area

It is noted that the calculations for scenario 2 provide the worst case calculated noise level for either the screener or the crusher operating. It is understood that the screener and crusher would not be used simultaneously and this is formalised as a condition of the approved planning permission Ref No CCC/22/057/FUL.

At an early stage of the calculations, localised screening requirements for the noise sources within the wet and dry recycling areas were identified. Two barriers are included in the calculations:

- A 4m high barrier to screen the crusher and screener in the dry recycling area. The exact location of the barrier has not been formalised in plans, but it needs to be located as close to the plant as possible whilst still allowing access. Crucially the barrier must be located so that it breaks the line of sight between the plant and the nearest dwellings; and

- A 4m high barrier to screen the wash plant area. The exact location of the barrier has not been formalised in plans, but it needs to be located as close to the plant as possible whilst still allowing access. Crucially the barrier must be located so that it breaks the line of sight between the screening plant and the loading shovel (when working close to the plant) and the nearest dwellings.

The location of the barriers as used in the noise modelling can be seen visually in the noise contour plots provided in Appendix F.

The proposed works in Year 16-30 of the development have not been calculated as the majority of noise sources will have been removed and the site noise levels would be expected to be significantly lower. The results of the site noise calculations in the following section represent the worst case scenarios, based on times of the year when all the proposed works on site could be occurring simultaneously and are based on workings at the highest ground levels (i.e. unscreened by the existing landforms).

6.1 Site Noise Calculation Results

The calculated site noise levels for each scenario identified above are presented in the tables below. The tables follow the BS4142:2014+A1:2019 methodology by comparing the calculated noise levels to background sound levels, providing an initial assessment of impact based on the difference between the rating level (calculated site noise level plus any corrections for acoustic character) and the representative background sound level.

The assumptions used in the calculations are presented in Appendix E.

The following comments are relevant for all the assessment tables presented:

Specific Sound Level

The specific sound level has been calculated based on the assumptions set out in the scenarios above using the sound power levels and assumptions set out in Appendix E, Tables E.1 and E.2.

Background Sound Level

Two background sound levels have been used in the assessment. A lower background sound level of 43dB $L_{A90,T}$ has been considered in accordance with the previous (2021) assessment for the site, but a typical background sound level of 48dB $L_{A90,T}$ is also considered based on the modal average of the historic results and typical background sound levels measured in 2024.

Acoustic Character Correction

At a distance, noise from machinery used at mineral workings (and associated plant / machinery) does not usually contain a distinguishable tone nor does it tend to be impulsive. However, as a precautionary measure and following the previous (2021) assessment, a +3dB acoustic feature correction has been included for ‘other sound character’.

Rating Level

The excess of rating level over background sound level is provided as a range to take into account both the worst case background sound levels and the typical background sound levels.

Scenario 1: Phase 1 (Year 1-2) – Works On Soil Heap

Table 6.1 – Summary of BS4142:2014+A1:2019 Assessment for Scenario 1

Results	Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
	All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
Specific Sound Level	44 dB $L_{Aeq,1hr}$	44 dB $L_{Aeq,1hr}$	32 dB $L_{Aeq,1hr}$	34 dB $L_{Aeq,1hr}$	46 dB $L_{Aeq,1hr}$	45 dB $L_{Aeq,1hr}$	32 dB $L_{Aeq,1hr}$	37 dB $L_{Aeq,1hr}$
Background Sound Level	43 / 48 dB $L_{A90,T}$				43 / 48 dB $L_{A90,T}$			
Acoustic Character Correction	+3dB				+3dB			
Rating Level	47 dB $L_{Ar,Tr}$	47 dB $L_{Ar,Tr}$	35 dB $L_{Ar,Tr}$	37 dB $L_{Ar,Tr}$	49 dB $L_{Ar,Tr}$	48 dB $L_{Ar,Tr}$	35 dB $L_{Ar,Tr}$	40 dB $L_{Ar,Tr}$
Excess of rating level over background sound level	+4 / -1 dB	+4 / -1 dB	-8 / -13 dB	-6 / -11 dB	+6 / +1 dB	+5 / 0 dB	-8 / -13 dB	-3 / -8 dB
Initial Assessment of Impact	The initial assessment of impact ranges from a low level of impact (rating levels are below or just above the background sound level) to just below and just above the level indicating an adverse impact depending on the operations considered and the background sound level used. At both locations, impact is below the level indicating a significant adverse impact even when considering the worst case background sound levels. This is without the consideration of context.							

Scenario 2: Phase 2 (Year 3-15) – Infilling At Top Of Finished Level

Table 6.2 – Summary of BS4142:2014+A1:2019 Assessment for Scenario 2

Results	Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
	All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
Specific Sound Level	46 dB $L_{Aeq,1hr}$	44 dB $L_{Aeq,1hr}$	36 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$	47 dB $L_{Aeq,1hr}$	45 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$
Background Sound Level	43 / 48 dB $L_{A90,T}$				43 / 48 dB $L_{A90,T}$			
Acoustic Character Correction	+3dB				+3dB			
Rating Level	49 dB $L_{Ar,Tr}$	47 dB $L_{Ar,Tr}$	39 dB $L_{Ar,Tr}$	41 dB $L_{Ar,Tr}$	50 dB $L_{Ar,Tr}$	48 dB $L_{Ar,Tr}$	41 dB $L_{Ar,Tr}$	41 dB $L_{Ar,Tr}$
Excess of rating level over background sound level	+6 / +1 dB	+4 / -1 dB	-4 / -9 dB	-2 / -7 dB	+7 / +2 dB	+5 / 0 dB	-2 / -7 dB	-2 / -7 dB
Initial Assessment of Impact	The initial assessment of impact ranges from a low level of impact (rating levels are below or just above the background sound level) to above the level indicating an adverse impact depending on the operations considered and the background sound level used. At both locations impact is below the level indicating a significant adverse impact even when considering the worst case background sound levels. This is without the consideration of context.							

It is noted that the calculated noise levels using the SoundPLAN noise modelling software for both scenarios are slightly lower (and a margin lower for infilling operations) than originally calculated for the spreadsheet calculations submitted with the planning noise assessment (dated February 2024). The lower levels in the noise modelling are a result of the digital ground model which includes some screening from existing landforms, but also due to the inclusion of atmospheric absorption. Atmospheric absorption was not included in the spreadsheet calculations, but for most noise sources provides an additional 2-3dB attenuation.

6.2 Assessment of Impacts

The calculated noise levels from “All works” (i.e. all site operations occurring simultaneously) are comparable for both scenarios and at both assessment locations. The recycling operations generally control the calculated noise level, with some contribution from the infilling works and from the quarry.

West Wratting Valley Farm

The noise levels from “All works” were calculated to be 44 and 46 dB $L_{Aeq,1hr}$ for Scenario 1 and Scenario 2 respectively. Inclusion of a 3dB character feature correction gives a rating level of 47 and 49 dB L_{ArTr}.

Compared to the lower range of background sound levels, this gives an excess of rating over background sound level of +4 to +6dB in comparison with the upper and lower background sound levels considered. This is just below and just above the point at which adverse impact might be expected to arise, but below the point at which significant adverse impact might be expected, this is however dependent on the context.

Compared to the typical range of background sound levels, the excess of rating over background sound level is -1 to +1dB. This is a good margin below the point at which adverse impact might be expected to arise, although as above this is also dependent on the context.

Valley Farm Cottage

The noise levels from “All works” were calculated to be 46 and 47 dB $L_{Aeq,1hr}$ for Scenario 1 and Scenario 2 respectively. Inclusion of a 3dB character feature correction gives a rating level of 49 and 50 dB L_{ArTr}.

Compared to the lower range of background sound levels, this gives an excess of rating over background sound level of +6 to +7dB. This is above the point at which adverse impact might be expected to arise, but below the point at which significant adverse impact might be expected, this is however dependent on the context.

Compared to the typical range of background sound levels, the excess of rating over background sound level is +1 to +2dB. This is below the point at which adverse impact might be expected to arise, although as above this is also dependent on the context.

Context

BS4142:2014+A1:2019 states:

> *"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. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."*

Contextual factors are relevant for this site, particularly with regard to typical background and ambient sound levels and the location of the site relative to the nearest dwellings. Contextual factors are considered on the following page.

Additional guidance on how to consider contextual factors can be found in the Government guidance document (Environment Agency) "*Method implementation document (MID) for BS 4142*".

Context – Background Sound Levels

The assessment indicates that an adverse impact could arise when background sound levels fall lower (a typical lower value of 43dB L_{A90} has been used in the assessment). The lowest measured background sound levels (as presented in the MAS Environmental Ltd 2021 report) were found under southerly wind conditions. Under these conditions the site would be upwind from the nearest residential receivers and so the scenario would not arise whereby lowest background sound levels coincided with propagation conditions likely to result in the highest site noise levels, i.e. the wind would be expected to take some of the site noise away from the properties. Meteorological effects have not been included in the calculations in this assessment. However, upwind reductions in noise level can be up to 10dB(A).

More typically, background sound levels were measured in the region of 48dB L_{A90} as supported by the January 2024 survey results. Whilst some periods had measured levels below this, there were a number of periods where background sound levels were in the region of 50dB L_{A90}. Under these conditions, the calculated site noise level is equal to or slightly below the typical background sound level. It is only the inclusion of the acoustic feature correction (which may not be warranted) that gives a rating level slightly higher than the background sound level.

Thus, in context with the measured background sound levels, the calculated site noise levels will for much of the time be similar to or below the existing baseline sound environment at the receptors.

Context – Residual / Ambient Sound Levels

EA guidance on the use of BS4142:2014+A1:2019 states that factors such as a low absolute level of sound can be a considered as a less sensitive context.

The January 2024 survey results found residual sound levels at the nearest dwellings were generally controlled by road traffic noise, occasional light aircraft and psithurism. The residual sound levels ranged from 47-57dB $L_{Aeq,T}$ with averages of 49 and 51 dB $L_{Aeq,T}$ for each of the survey days. The calculated site noise levels (44-47dB $L_{Aeq,1hr}$) and rating levels (47-50dB L_{ArTr}) are well within the range of measured residual sound levels.

Whilst site noise may be audible at times, based on the measured residual sound levels site noise it is not expected to dominate or dictate the ambient sound environment at the nearest dwellings.

Context - Character of the Locality

EA guidance on the use of BS4142:2014+A1:2019 states that factors such as ‘where the sound occurs’, ‘the residual acoustic environment’, ‘new industry or new residences’ should be considered as part of the context, with less sensitive contexts including ‘more industry’, ‘long standing industry’ and ‘polluted soundscape’.

The site and locality are largely rural, surrounded by agricultural fields. However, the Camgrain site is located approximately 600m to the east of the dwellings and the sound environment in the locality is largely controlled by road traffic noise from the A11. Whilst noise from the Camgrain site was not audible during the January 2024 survey, a number of HGVs visiting the site were observed on the local roads and were audible at the monitoring location. Furthermore, Wilbraham Chalk Pit is an established mineral site with permission for ongoing extraction and infilling operations and forms part of the existing soundscape in the area.

Given the existing and established operations in the locality, there is an expectation of some commercial / industrial noise (and associated sources) in the area. The proposals in this application do not introduce new or novel noise sources to an area where there was historically no industry. It is noted that the proposals introduce new plant / machinery, but this is not out of context from the existing operations.

Context - Time of Day

EA guidance on the use of BS4142:2014+A1:2019 states that factors such as 'weekdays versus weekends' and 'time of day' should be considered as part of the context, with less sensitive contexts including '9am to 5pm' and 'weekdays only'.

The site's permitted operating hours are:

- Monday to Friday – 07:00 – 18:00
- Saturday 07:00 – 13:00

The operations are confined to normal daytime hours and whilst there is some proposed operation at the weekend, this is restricted to a period typically considered as the least noise sensitive period (Saturday morning). As such, evenings and the majority of the weekend period remain protected from noise.

Conclusions on Context

The initial assessment of impact ranges from below adverse impact to above adverse impact, but remains below significant adverse impact.

Given the contextual considerations discussed above, the initial assessment of impact as being potentially representative of an adverse impact could be lowered. It is expected that during periods of low background sound levels, noise from the site will be audible at times. Adverse impact could arise, but is dependent on the nature of the workings, the calculations assume that all works occur simultaneously and for the quarry / infilling works at the highest (unscreened) point at which working is likely to occur and at the closest point on the site to the dwellings. In reality, site noise levels at the receiver locations considered would be expected to be lower.

For much of the time, the calculated site noise levels are expected to fall within a similar magnitude to typical background sound levels and generally below the residual noise levels. During these periods site noise is unlikely to be audible, or may be audible at times but will be below the point at which adverse impact would be expected.

Where it is established that an adverse impact arises, the requirement is to mitigate and minimise potential adverse noise impacts. Mitigation employed at the site is discussed below.

7 Mitigation

A number of mitigation measures already exist on site for reducing the noise impact of the operations. The assessment set out in this report identifies further potential mitigation measures in the form of localised screening. There is a general requirement in Government policy to mitigate and minimise adverse noise impacts as far as reasonably practicable. This requirement is met at this site with the following measures:

Two barriers have been included in the noise modelling and are recommended as follows:

- A 4m high barrier to screen the crusher and screener in the dry recycling area. The exact location of the barrier has not been formalised in plans, but it needs to be located as close to the plant as possible whilst still allowing access. Crucially the barrier must be located so that it breaks the line of sight between the plant and the nearest dwellings; and

- A 4m high barrier to screen the wash plant area. The exact location of the barrier has not been formalised in plans, but it needs to be located as close to the plant as possible whilst still allowing access. Crucially the barrier must be located so that it breaks the line of sight between the screening plant and the loading shovel (when working close to the plant) and the nearest dwellings.

It is understood that the following mitigation measures have already been and continue to be implemented at the site as confirmed with Mead Construction Ltd:

- Controls for dust suppression mean that crushing does not take place when the wind is towards the nearest dwellings. This also means that crushing will not take place when the worst case conditions for noise propagation arise;

- A diary is kept of operations on site and includes logging of equipment / machinery in use and the weather conditions at the site; and
- Plant / machinery on site is fitted with broadband or silent types of alarm or warning devices that are more environmentally acceptable than reversing bleepers.

It is understood that the following mitigation measures will be implemented at the site as confirmed with Mead Construction Ltd:

- The crusher and the screener in the dry recycling area will not operate simultaneously;
- The potential for three screeners is included in the calculations. However, during chalk processing (late August to early October) it is more likely that one of the two screeners in the recycling area would be moved and used in the quarry. This would reduce the need for additional plant on site and result in only two screeners in use rather than the three included in the calculations;
- Soils removed from the mound in Phase 1 will be worked such that the existing land forms a working face, behind which processing of material can take place for as long as practical before working in unscreened areas; and
- Toolbox talks will be scheduled to remind employees of their duties to minimise noise on site, including adhering to site speed limits, maintaining equipment and machinery, switching engines / plant and machinery off when not in use (not left idling).

8 Summary and Conclusions

Mead Construction Ltd (Mead) are submitting an application to the Environment Agency for a permit for their site at Wilbraham Chalk Pit.

Planning permission was granted by Cambridgeshire County Council on 07 May 2024 (Ref No CCC/22/057/FUL) for continued mineral extraction and progressive landfilling with inert waste, temporary use of land for bulking as well as wet and dry processing of inert and non-hazardous soils and hardcore using a crusher, screener and wash plant.

This report sets out the calculated noise levels arising from the operation of the site for use in a BS 4142:2014+A1:2019 assessment at the nearest dwellings to the site.

This report is a revised version of the original report (dated February 2024) submitted with the planning application but with the site noise levels recalculated using SoundPLAN noise modelling software. SoundPLAN uses the calculation methodology set out in ISO9613-2, which has been specifically requested by the Environment Agency in this case.

Updated baseline noise surveys have been undertaken in the area to supplement previous data from July 2021 and all the data obtained has been used for comparison with the calculated site noise levels for the typical worst case operations at the site.

The noise levels from both typical worst case scenarios considered were calculated to be 44-46dB $L_{Aeq,1hr}$ at West Wratting Valley Farm and 46-47dB $L_{Aeq,1hr}$ at Valley Farm Cottage. Inclusion of a 3dB character feature correction gives a rating level of 47-49dB L_{ArTr} for West Wratting Valley Farm and 49-50dB L_{ArTr} for Valley Farm Cottage.

Compared to the lower range of background sound levels (i.e. a worst case scenario), this gives an excess of rating over background sound level of +4 to +6dB for West Wratting Valley Farm and +6 to +7dB for Valley Farm Cottage. This is just below and just above the point at which adverse impact might be expected to arise, but below the point at which significant adverse impact might be expected, depending on the context.

Compared to the typical range of background sound levels, the excess of rating over background sound level is -1 to +1dB for West Wratting Valley Farm and +1 to +2dB for Valley Farm Cottage. This is below the point at which adverse impact might be expected to arise, depending on the context.

Given contextual considerations, the initial assessment of the noise impact as being potentially adverse could be lowered. It is expected that during periods of low background sound levels, noise from the site will be audible at times. Adverse impact could arise, but is dependent on the nature of the workings; the calculations assume that all works occur simultaneously and for the quarry / infilling works at the highest (unscreened) ground height and at the closest point on site to the dwellings. In reality, site noise levels would be expected to be lower.

Where adverse impact arises, the requirement is to mitigate and minimise potential adverse noise impacts. A number of appropriate measures have been adopted at the site to prevent and minimise noise impact as set out in Section 7 of this report.

However, for much of the time using typical background sound levels, impact will remain below the point at which an adverse impact would be expected to arise. Calculated site noise levels fall within (and generally below) residual sound levels and are equal to typical background sound levels. During these periods impact is expected to be low.

At times, noise will be audible from the site, but site noise will also be masked for much of the time by other local sources, such as the A11.

Based on this assessment and providing that the recommended measures are implemented and maintained, it is concluded that the site can be operated while keeping noise levels to within environmentally acceptable limits.

Sarah Large MA (Cantab) MSc Dip (IoA) MIOA
Senior Consultant

(This document has been generated electronically and therefore bears no signature)

Appendix A – Glossary of Acoustic Terms

General Noise and Acoustics

The following section describes some of the parameters that are used to quantify noise.

Decibels dB

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure ($2x10^{-5}$ Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

A-weighted Decibels dB(A)

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

Façade Noise Level

Façade noise measurements are those undertaken near to reflective surfaces such as walls, usually at a distance of 1m from the surface. Façade noise levels at 1m from a reflective surface are normally around 3 dB greater than those obtained under freefield conditions.

Freefield Noise Level

Freefield noise measurements are those undertaken away from any reflective surfaces other than the ground

Frequency Hz

The frequency of a noise is the number of pressure variations per second, and relates to the "pitch" of the sound. Hertz (Hz) is the unit of frequency and is the same as cycles per second. Normal, healthy human hearing can detect sounds from around 20 Hz to 20 kHz.

Octave and Third-Octave Bands

Two frequencies are said to be an octave apart if the frequency of one is twice the frequency of the other. The octave bandwidth increases as the centre frequency increases. Each bandwidth is 70% of the band centre frequency.

Two frequencies are said to be a third-octave apart if the frequency of one is 1.26 times the other. The third octave bandwidth is 23% of the band centre frequency.

There are recognised octave band and third octave band centre frequencies. The octave or third-octave band sound pressure level is determined from the energy of the sound which falls within the boundaries of that particular octave of third octave band.

Appendix A (continued)

Day Evening Night Level L_{den}

The day evening night level is the average A-weighted sound level over a 24 hour period, determined from the L_{day} ($L_{Aeq,12hr}$ 7am-7pm), $L_{evening}$ ($L_{Aeq,4hr}$ 7pm-11pm) and L_{night} ($L_{Aeq,8hr}$ 11pm-7am), with a 5 dB penalty added to the $L_{evening}$ and a 10 dB penalty added to the L_{night}.

Equivalent Continuous Sound Pressure Level $L_{Aeq,T}$

The 'A'-weighted equivalent continuous sound pressure level $L_{Aeq,T}$, is a notional steady level which has the same acoustic energy as the actual fluctuating noise over the same time period T. The $L_{Aeq,T}$ unit is dominated by higher noise levels, for example, the $L_{Aeq,T}$ average of two equal time periods at, for example, 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A).

The $L_{Aeq,}$ is the chosen unit of BS 7445-1:2003 "Description and Measurement of Environmental noise".

Maximum Sound Pressure Level L_{Amax}

The L_{Amax} value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval. Maximum levels are measured with either a fast or slow time weighted, denoted as $L_{Amax,f}$ or $L_{Amax,s}$ respectively.

Noise Rating NR

The noise rating level is a single figure index obtained from an octave band analysis of a noise. The NR level is obtained by comparing the octave band sound pressure levels to a set of reference curves and the highest NR curve that is intersected by the sound pressure levels gives the NR level.

Sound Exposure Level L_{AE} or SEL

The sound exposure level is a notional level which contains the same acoustic energy in 1 second as a varying 'A'-weighted noise level over a given period of time. It is normally used to quantify short duration noise events such as aircraft flyover or train passes.

Statistical Parameters L_N

In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the $L_{A01,T}$, $L_{A10,T}$ and the $L_{A90,T}$.

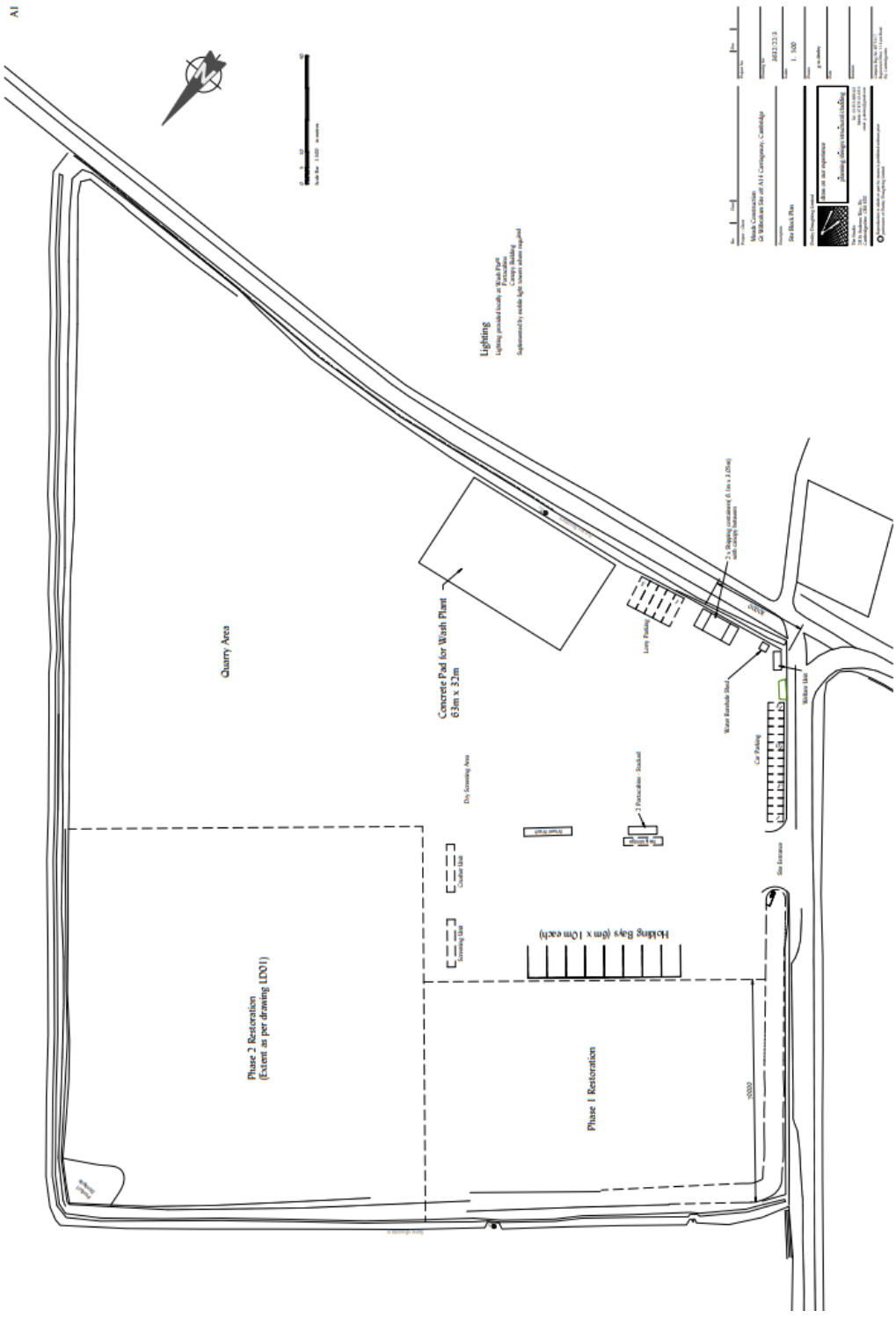
$L_{A01,T}$ is the 'A'-weighted level exceeded for 1% of the time interval T and is often used to gives an indication of the upper maximum level of a fluctuating noise signal.

$L_{A10,T}$ is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the $L_{A10,T}$ unit is typically 2–3 dB(A) above the $L_{Aeq,T}$ value over the same period.

$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

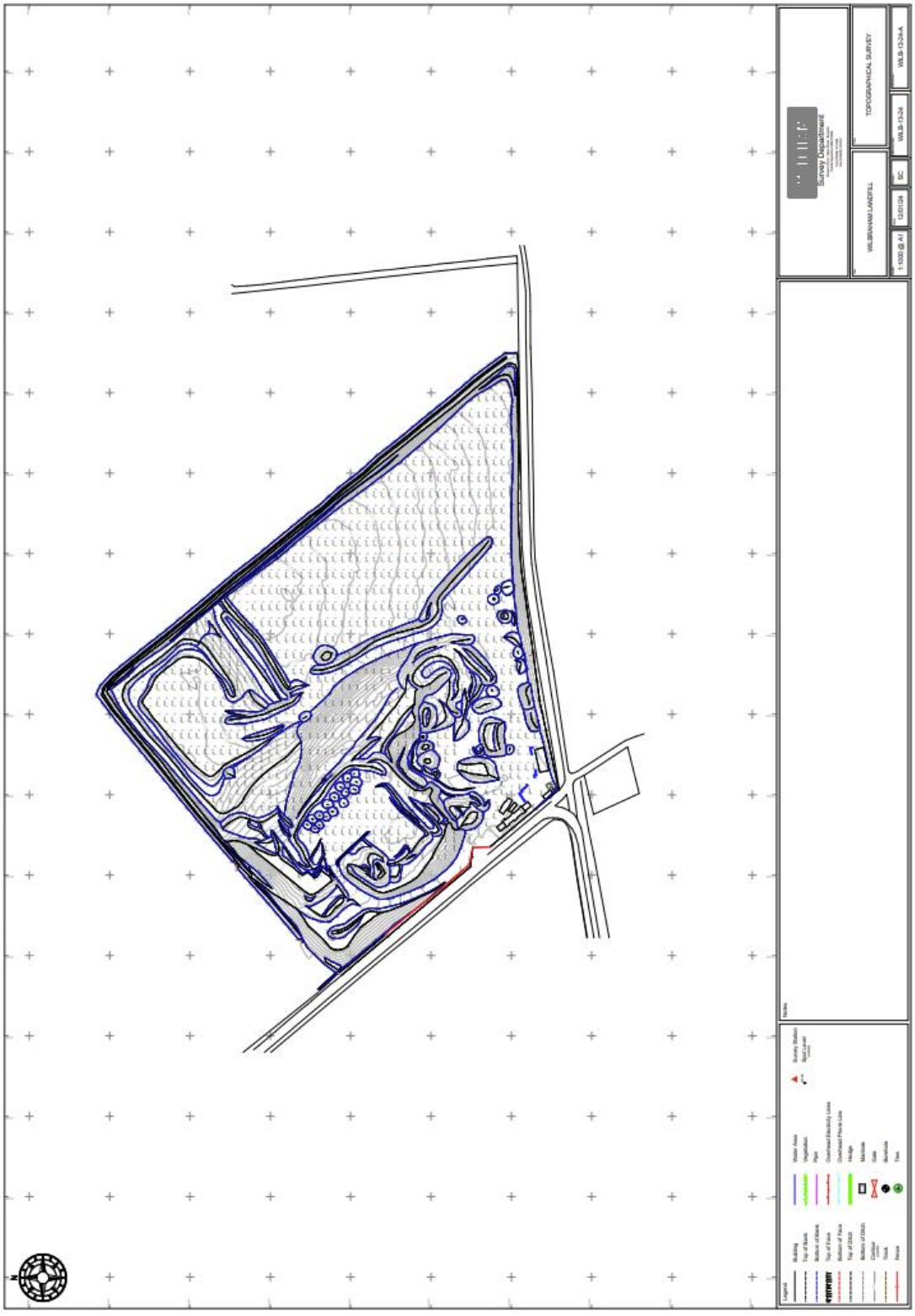
Appendix B – Site Plans and Noise Monitoring Locations

Plan B.1: Site Plan



Appendix B (continued)

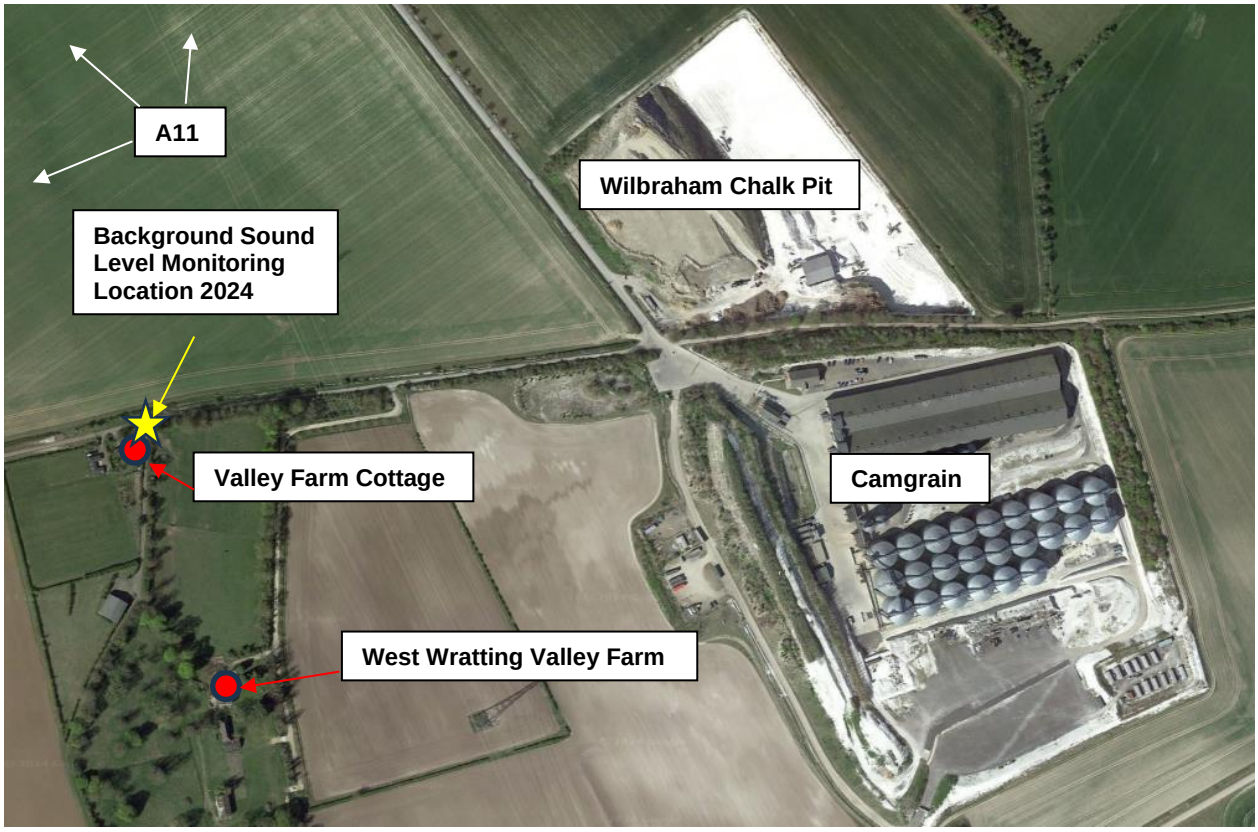
Plan B.2: Topographical Survey (12.01.24)



Appendix B (continued)

Plan B.2: Background Sound Level Monitoring Location and Assessment Locations

The location of the background sound level measurements used in January 2024 and the two assessment locations (representative of the nearest residential dwellings to the site) are shown on the plan below.



Appendix C – Survey Details and Results

Date and Locations of Surveys

Thursday 4th January 2024 between 10:00 and 13:00.

Tuesday 9th January 2024 between 10:20 and 12:15.

Noise measurement locations shown on Plan B.2 in Appendix B.

Surveys carried out by

Sarah Large

Weather Conditions

Thursday 4th January 2024

Dry, sunny, 5% cloud but mostly clear sky, 8°C. SW breeze, mostly still with gusts at 0-2m/s.

Tuesday 9th January 2024

Dry, sunny, clear sky, 0-1°C. ENE breeze, wind speeds mixed with periods of stillness followed by gusts of 3-5m/s and up to 6m/s.

Instrumentation and Calibration

The instrumentation used (including serial number in brackets) is tabulated below. The sensitivity of the meter was verified on site immediately before and after the survey using the field calibrator. The measured calibration levels were as follows:

Instrumentation	Date	Start Cal	Mid Cal*	End Cal
Norsonic 140 Sound Level Meter (1402998) Norsonic 1251 Calibrator (32466)	04/01/2024	113.8 dB(A)	113.8 dB(A) 114.0 dB(A)	113.9 dB(A)
	09/01/2024	114.1 dB(A)	N/A	114.1 dB(A)

* Due to battery failure during the first measurement (and subsequent battery replacement) the sound level meter was calibrated immediately after battery replacement and midway through the survey period.

The meter and calibrator are tested monthly against Norsonic Calibrators, type 1253 (serial number 22906) and type 1256 (serial number 125626100) both with UKAS approved laboratory certificates of calibration. In addition, the meter and calibrator undergo traceable calibration at an external laboratory every two years.

Appendix C (continued)

Survey Details

Attended sample measurements of 15 minute duration were taken in a free field location representative of the nearest dwellings to the site as shown on Plan B.2 in Appendix B. The microphone was at a height of between 1.2 and 1.5 metres above local ground level, with a windshield used throughout.

Observations

In general the sound environment was dominated by road traffic noise from the A11. During the measurements on 9th January 2024 the ambient sound levels were also influenced by light aircraft flying loops in the area. Site activity was inaudible. A description of the main noise sources during each measurement period is presented in the results table below.

Survey Results – 4th January 2024

Start Time	Results dB (T = 15 minutes)				Comments / Observations
	$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A10,T}$	$L_{A90,T}$	
10:03	50*	56*	52*	48*	Constant distant road traffic noise. Distant bird scarers. Birdsong. Horses in nearby field. Voices at nearby dwelling. Breeze in trees (dry leaves).
10:36	50	64	52	45	Distant constant road traffic noise. Birdsong. Voices from around dwelling. Light aircraft.
10:51	47	59	49	45	Constant distant road traffic noise. Birdsong. Breeze in trees (dry leaves). Tonal reverse alarms (not site).
11:42	49	74	50	45	Constant distant road traffic noise. Birdsong. Local car pass.
11:57	47	54	49	45	Constant distant road traffic noise. Birdsong. Still - no wind. Light aircraft.
12:12	49	67	51	44	Constant distant road traffic noise. Birdsong. Breeze in trees (dry leaves). Delivery van drives past, engine idling, drives away. Light aircraft.
12:27	49	67	50	45	Constant distant road traffic noise. Birdsong. Breeze in trees (dry leaves). Light aircraft.

*T= 8 minutes

Appendix C (continued)

Survey Results – 9th January 2024

Start Time	Results dB (T = 15 minutes)				Comments / Observations
	$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A10,T}$	$L_{A90,T}$	
10:21	51	64	52	48	Road traffic noise dominant. Minimal observed activity on site, no site noise audible. Occasional rustling of leaves when wind increases. Some sporadic birdsong.
10:36	51	60	52	48	Road traffic noise dominant. Breeze in trees. 2 x lorries on site, not audible.
10:51	52	70	53	49	Road traffic noise. Breeze in trees (gusts).
11:06	54	80	56	49	Road traffic noise, jet aircraft, breeze in leaves (gusty). Light aircraft circling.
11:21	57	81	60	51	Road traffic, breeze in leaves / trees, light aircraft circling.
11:36	52	72	54	49	Road traffic, breeze in leaves / trees (strong gusts up to 6-7m/s), light aircraft circling.
11:51	52	66	54	48	Road traffic, breeze in leaves / trees (strong gusts up to 6-7m/s), light aircraft circling.

Appendix D – BS 4142:2014+A1:2019 Information to be Reported

(a) Statement of Qualifications

See details about The Author on page 2 of this report.

(b) Source Being Assessed

1) Description of the main sound sources and of the specific sound

The proposed works are set out in Section 2.1 'Site Operation' with further information on the noise sources and sound power levels provided in Section 5.2.

2) Hours of operation

The normal hours of operation are Monday to Friday 07:00 – 18:00 and Saturdays 07:00 – 13:00.

3) Mode of operation (e.g. continuous, twice a day, only in hot weather)

For the purposes of this assessment, it is assumed that operations are continuous (always operational). This presents a worst case assessment approach. However, many of the sources are to be in seasonal use and for much of the time all sources will not be operating simultaneously.

4) Statement of operational rates of the main sound sources (e.g. maximum load setting, 50% max rate, low load setting)

The majority of plant is assumed to have 100% operational on time, unless this is unrepresentative of how the plant / machinery will be used. The sound power levels and assumed percentage on times are set out in Table 5.1.

5) Description of premises in which the main sound sources are situated (if applicable).

See detailed description of the site in Section 2.1 'Site Operation'.

A plan showing the site layout is provided in Appendix B.

All of the operations are assumed to be located outside (i.e. not enclosed within buildings).

(c) Subjective Impressions

1) Dominance or audibility of the specific sound

Not all of the specific sound sources are in place yet at the site and during both surveys in January 2024 the site was only operational to a minimal extent and was not audible at the monitoring location. It is expected that during lower background sound levels, some elements of the site noise may be audible at times. However, during higher background sound levels site noise is unlikely to be readily audible.

2) Main sources contributing to the residual sound.

In general the sound environment was dominated by road traffic noise from the A11. During the measurements on 9th January 2024 the ambient sound levels were influenced by light aircraft flying loops in the area. Other sources noted were birdsong and psithurism.

Appendix D (continued)

(d) The Existing Context and Sensitivity of Receptor

With regard to sensitivity, the assessment locations are residential properties and are therefore considered to be of “High” sensitivity.

The site and locality are largely rural, surrounded by agricultural fields. However, the Camgrain site is located approximately 600m to the east of the dwellings and the sound environment in the locality is largely controlled by road traffic noise from the A11. Whilst noise from the Camgrain site was not audible during the January 2024 survey, a number of HGVs visiting the site were observed on the local roads and were audible at the monitoring location. Furthermore, Wilbraham Chalk Pit is an established mineral site with permission for ongoing extraction and infilling operations and forms part of the existing soundscape in the area.

Context has been considered in detail in Section 6.2.

(e) Measurement Locations and Justification

Measurement locations, their distance from the specific sound source, the topography of the intervening ground and any reflecting surface other than the ground, including a photograph, or a dimensioned sketch with a north marker. A justification for the choice of measurement locations should also be included.

The nearest residential housing is located to the south-west of the site. Baseline sound levels measured in 2024 were undertaken at a location representative of these nearest dwellings to the site. A plan showing the measurement and assessment locations is provided in Appendix B.

The data were used to determine the existing acoustic environment and to measure residual (ambient) and background sound levels in the vicinity of the dwellings.

The topography of the ground between the site and the nearest residential dwellings is largely flat, though with a slightly lower ground height in the middle of the source to receiver path. Site noise calculations have been undertaken using SoundPLAN noise mapping software. A digital ground model (DGM) was created using local ground heights to cover the area including both the site and the nearest residential properties in the vicinity of the site. The existing and proposed ground contours are based on topographical data provided by Mead and as shown on the plans in Appendix B. The soil washing plant and recycling facility was confirmed by Mead to be constructed on a ground level of approximately 38m AOD..

(f) Sound Measuring Systems, Including Calibrator / Pistonphone

1) Type

See Appendix C

2) Manufacturer

See Appendix C

3) Serial number

See Appendix C

4) Details of the latest verification test including dates

See Appendix C

Appendix D (continued)

(g) Operational Test

1) *Reference level(s) of calibrator, multi-function calibrator or pistonphone;*
   See Appendix C

2) *Meter reading(s) before and after measurements with calibrator, multi-function calibrator or pistonphone applied.*
   See Appendix C

(h) Weather Conditions

1)	*Wind speed(s) and direction(s)*	See Appendix C
2)	*Presence of conditions likely to lead to temperature inversion (e.g. calm nights with little cloud cover)*	None.
3)	*Precipitation*	None.
4)	*Fog*	None.
5)	*Wet ground*	None.
6)	*Frozen ground or snow coverage*	None.
7)	*Temperature:*	See Appendix C
8)	*Cloud Cover*	See Appendix C

(i) Date(s) and Time(s) of Measurements

See Appendix C

(j) Measurement Time Intervals

15 minutes unless otherwise stated (see Appendix C)

(k) Reference Time Interval(s)

The reference time interval is 1 hour for the daytime assessment between 07:00 to 23:00 hours.

(l) Specific Sound Level

1) Measured sound level(s)

The sound power levels of the machinery to be used on site are based primarily on manufacturers' data and supplemented with typical measurements of such similar plant items which are contained on the WBM plant noise database. Some items of plant that are currently in use on site were measured in situ and presented in the MAS Environmental Ltd report dated July 2021.

The sound power levels, source heights and assumed percentage on times used in the assessment are set out in Appendix E.

Appendix D (continued)

2) Residual sound level(s) and method of determination

The residual sound levels were measured during the surveys in January 2024 when the site was only operational to a minimal extent and was not audible at the monitoring location. The residual sound levels during both survey days were controlled by road traffic noise from the A11 and on 9th January 2024 the levels were also influenced by light aircraft flying loops in the area. Other sources noted were birdsong and psithurism.

The residual sound levels are set out in Section 4.3 and Table 4.2 and are summarised below. As during both surveys the site was minimally operational and not audible at the monitoring location the ambient and residual sound levels are the same.

Thursday 4 January 2024 (SW wind)	Tuesday 9 January 2024 (ENE wind)
49 (47-50) dB $L_{Aeq,T}$	53 (51-57) dB $L_{Aeq,T}$

3) Ambient sound level(s) and method of determination

The ambient sound levels were measured during the surveys in January 2024 when the site was only operational to a minimal extent and was not audible at the monitoring location. The ambient sound levels during both survey days were controlled by road traffic noise from the A11 and on 9th January 2024 the levels were also influenced by light aircraft flying loops in the area. Other sources noted were birdsong and psithurism.

As during both surveys the site was minimally operational and not audible at the monitoring location the ambient and residual sound levels are the same.

Thursday 4 January 2024 (SW wind)	Tuesday 9 January 2024 (ENE wind)
49 (47-50) dB $L_{Aeq,T}$	53 (51-57) dB $L_{Aeq,T}$

4) Specific sound level(s) and method of determination

The specific sound levels are set out in Section 6 'Noise Assessment' and in Tables 6.1 and 6.2.

The specific sound levels for the daytime were calculated as the majority of sources are not currently operational or are not yet on site. The calculated specific daytime noise levels are as follows:

Scenario 1: Phase 1 (Year 1-2) – Unscreened Works On Soil Heap							
Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
All works	Recycling Only	Infilling Only	Quarry Only	All works	Recycling Only	Infilling Only	Quarry Only
44 dB $L_{Aeq,1hr}$	44 dB $L_{Aeq,1hr}$	32 dB $L_{Aeq,1hr}$	34 dB $L_{Aeq,1hr}$	46 dB $L_{Aeq,1hr}$	45 dB $L_{Aeq,1hr}$	32 dB $L_{Aeq,1hr}$	37 dB $L_{Aeq,1hr}$

Appendix D (continued)

Scenario 2: Phase 2 (Year 3-15) – infilling At Top Of Finished Level							
Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
46 dB $L_{Aeq,1hr}$	44 dB $L_{Aeq,1hr}$	36 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$	47 dB $L_{Aeq,1hr}$	45 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$

5) Justification of methods

The specific sound levels for the daytime were calculated as the majority of sources are not currently operational or are not yet on site.

6) Details of any corrections applied

Screening attenuation has been included in the calculations for two separate 4m high barriers around parts of the wet and dry recycling areas.

An acoustic feature correction of +3dB has been applied to account for 'other acoustic features'.

(m) Background Sound Level(s)

Background sound level(s) and measurement time interval(s) and, in the case of measurements taken at an equivalent location, the reasons for presuming it to be equivalent.

Background sound levels were historically measured in the area in connection with a separate application at the site to cover a waste recycling and transfer station. The findings of the survey were presented in a MAS Environmental Ltd report dated July 2021

Background sound levels were also measured during the surveys in January 2024 when the site was only operational to a minimal extent and was not audible at the monitoring location. The measurement location was adjacent to the entrance of one the nearest dwellings to the site and is considered to be representative of the background sound environment at the nearest dwellings.

The background sound levels are set out in Section 4.0. The results from the January 2024 survey are summarised below.

Thursday 4 January 2024 (SW wind)	Tuesday 9 January 2024 (ENE wind)
45 (44-48) dB $L_{A90,T}$	49 (48-51) dB $L_{A90,T}$

Appendix D (continued)

(n) Rating Level(s)

1) Specific sound level(s)

The specific sound level(s) stated earlier are:

Scenario 1: Phase 1 (Year 1-2) – unscreened works on soil heap							
Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
44 dB $L_{Aeq,1hr}$	44 dB $L_{Aeq,1hr}$	32 dB $L_{Aeq,1hr}$	34 dB $L_{Aeq,1hr}$	46 dB $L_{Aeq,1hr}$	45 dB $L_{Aeq,1hr}$	32 dB $L_{Aeq,1hr}$	37 dB $L_{Aeq,1hr}$

Scenario 2: Phase 2 (Year 3-15) – infilling at top of finished level							
Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
46 dB $L_{Aeq,1hr}$	44 dB $L_{Aeq,1hr}$	36 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$	47 dB $L_{Aeq,1hr}$	45 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$	38 dB $L_{Aeq,1hr}$

2) Any acoustic features of the specific sound

At a distance, noise from machinery used at mineral workings (and associated plant / machinery) does not usually contain a distinguishable tone nor does it tend to be impulsive. However, as a precautionary measure and following the previous (2021) assessment a +3dB acoustic feature correction has been included for 'other sound character'.

3) Rating level(s)

The rating sound levels are:

Scenario 1: Phase 1 (Year 1-2) – Unscreened Works On Soil Heap							
Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
47 dB $L_{Aeq,1hr}$	47 dB $L_{Aeq,1hr}$	35 dB $L_{Aeq,1hr}$	37 dB $L_{Aeq,1hr}$	49 dB $L_{Aeq,1hr}$	48 dB $L_{Aeq,1hr}$	35 dB $L_{Aeq,1hr}$	40 dB $L_{Aeq,1hr}$

Appendix D (continued)

Scenario 2: Phase 2 (Year 3-15) – Infilling At Top Of Finished Level							
Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
49 dB $L_{Aeq,1hr}$	47 dB $L_{Aeq,1hr}$	39 dB $L_{Aeq,1hr}$	41 dB $L_{Aeq,1hr}$	50 dB $L_{Aeq,1hr}$	48 dB $L_{Aeq,1hr}$	41 dB $L_{Aeq,1hr}$	41 dB $L_{Aeq,1hr}$

o) Excess of the level(s) over background sound level(s)

Excess of the rating level(s) over the measured background sound level(s) and the initial estimate of the impacts

The excess of the rating levels over the representative background sound levels are presented in the following tables:

Scenario 1: Phase 1 (Year 1-2) – Unscreened Works On Soil Heap							
Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
+4 / -1 dB	+4 / -1 dB	-8 / -13 dB	-6 / -11 dB	+6 / +1 dB	+5 / 0 dB	-8 / -13 dB	-3 / -8 dB

Scenario 2: Phase 2 (Year 3-15) – Infilling At Top Of Finished Level							
Loc 1 – West Wratting Valley Farm				Loc 2 – Valley Farm Cottage			
All works	**Recycling Only**	**Infilling Only**	**Quarry Only**	**All works**	**Recycling Only**	**Infilling Only**	**Quarry Only**
+6 / +1 dB	+4 / -1 dB	-4 / -9 dB	-2 / -7 dB	+7 / +2 dB	+5 / 0 dB	-2 / -7 dB	-2 / -7 dB

When the rating level is above the background sound level, a difference of around +5 dB is likely to indicate an adverse impact and a difference of around +10 dB or more is likely to indicate a significant adverse impact, depending on the context.

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.

Appendix D (continued)

(p) Conclusions of the assessment after taking context into account

Context has been considered in detail in Section 6.2 'Assessment of Impacts' of this report.

The initial assessment of impact ranges from below the level indicating an adverse impact to above the level indicating an adverse impact depending on the background sound level used, but remains below the level indicating a significant adverse impact.

Given the contextual considerations discussed above, the initial assessment of the noise impact could be lowered. It is expected that during periods subject to low background sound levels, noise from the site will be audible at times. Adverse impact could arise but this is dependent on the nature of the workings, the calculations assume that all works occur simultaneously and for the quarry / infilling works at the highest (unscreened) point above ground level at which workings will take place and at the closest point on site to the dwellings. In reality, site noise levels would be expected to be lower than those presented.

Where it is established that an adverse impact may arise, the requirement is to mitigate and minimise potential adverse noise impacts. Mitigation employed at the site is discussed in Section 7 of this report.

For much of the time, the calculated site noise levels are expected to fall within a similar magnitude to typical background sound levels and generally below the residual noise levels. During these periods, site noise is unlikely to be audible, or may be audible at times, but will be below the point at which adverse impact would be expected.

(q) The potential impact of uncertainty

Section 10 of BS 4142:2014+A1:2019 states: "*Consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty. Report the level and potential effects of uncertainty*."

One of the largest levels of uncertainty is whether the proposed activity gives rise to the calculated noise level at the receiver locations considered.

The measurements and assessment have been based on a realistic worst case scenario during the proposed daytime operating period.

The calculations are based on some sound power level information provided by the manufacturer rather than measurements of plant in situ. Sound power levels of plant and machinery can vary when on site and whilst there is some uncertainty with the actual levels occurring in reality, the assumptions are based on the concept of presenting a worst case scenario with all plant / machinery operating at the same time. Mitigation measures have been recommended to provide additional screening for the sources with highest sound power levels.

The calculations assume 50% hard (reflective) ground, whereas in reality there may be more ground absorption afforded by the ground nearer the site and closer to the receiver.

Consideration of uncertainty within the assessment therefore indicates that the conclusions regarding noise impact are unlikely to change significantly when accounting for uncertainty.

Appendix E - SoundPLAN Noise Mapping Assumptions

Calculations were undertaken using SoundPLAN 8.2.

Noise calculations were made using the methods detailed in ISO 9613-2 on a 5 metre grid at a calculation height of 1.5 metres above local ground level to represent ground floor level.

The calculations assume 50% soft / hard ground across the entirety of the calculation area.

Sound power level data has been included based on details provided by the applicant, using manufacturers' data and using information contained within the WBM plant noise database of previous measurements of similar plant items to those to be used on site.

A summary of the data input into the SoundPLAN calculations for Scenario 1 and Scenario 2 (see Section 6) is presented in the following table. None of the noise sources have been entered with a specific source directivity and are therefore assumed to be omnidirectional sources.

Table E.1: SoundPLAN Assumptions – Scenario 1

Plant Item / Description [Plan Reference]*	Grid Reference (x, y)	Sound Power Level dB L_{WA}	Source Height (m)	On time
HGV movements (recycling and infilling) [15]	556460.73, 254572.16 to 556458.84, 254575.07	104 (62 per metre at 15 km/h)	2	24 per hour
Screener on soil heap [1]	556459.09, 254672.03	104	3.5	100%
Excavator on soil heap [2]	556461.73, 254670.54	102	2	100%
Dust suppression on soil heap [3]	556456.11, 254675.33	109	2	50%
Dump truck (on soil heap) [19]	556461.12, 254676.63	107	2	33%
Dump truck (soil heap to wash plant) [9]	556462.40, 254677.81 to 556583.78, 254576.47	65/metre	2	100%
Wash plant (wet recycling) [4]	556585.22, 254560.31	83	5	100%
Loading shovel at wash plant [5]	556577.28, 254559.70	107	2	33%
Screener at wash plant [6]	556590.35, 254562.22	108	3.5	100%
Dump truck at wash plant [20]	556586.53, 254575.07	107	2	33%
Tractor and harrowing discs (quarry) [10]	556609.33, 254634.73	104	2	100%
Loading shovel (quarry) [11]	556606.86, 254625.64	107	2	50%
Screener (quarry) [12]	556607.37, 254616.73	108	3.5	100%
Excavator (quarry) [13]	556602.07, 254617.80	102	2	100%
Dump truck (wash plant to infilling) [17]	556586.75, 254578.85 to 556516.94, 254701.65	65/metre	2	100%
Tipping of infill [18]	556512.51, 254701.64	106	1	10%
Dump truck in infill area [21]	556515.54, 254703.94	107	2	33%
Dozer (infilling) [22]	556511.54, 254709.23	107	2	100%

* See Plan E.1 for noise source locations. Note these are the object references as allocated in SoundPLAN, numbering is not sequential (i.e. there are not noise sources with object reference 14, 15, 16 etc).

Appendix E (continued)

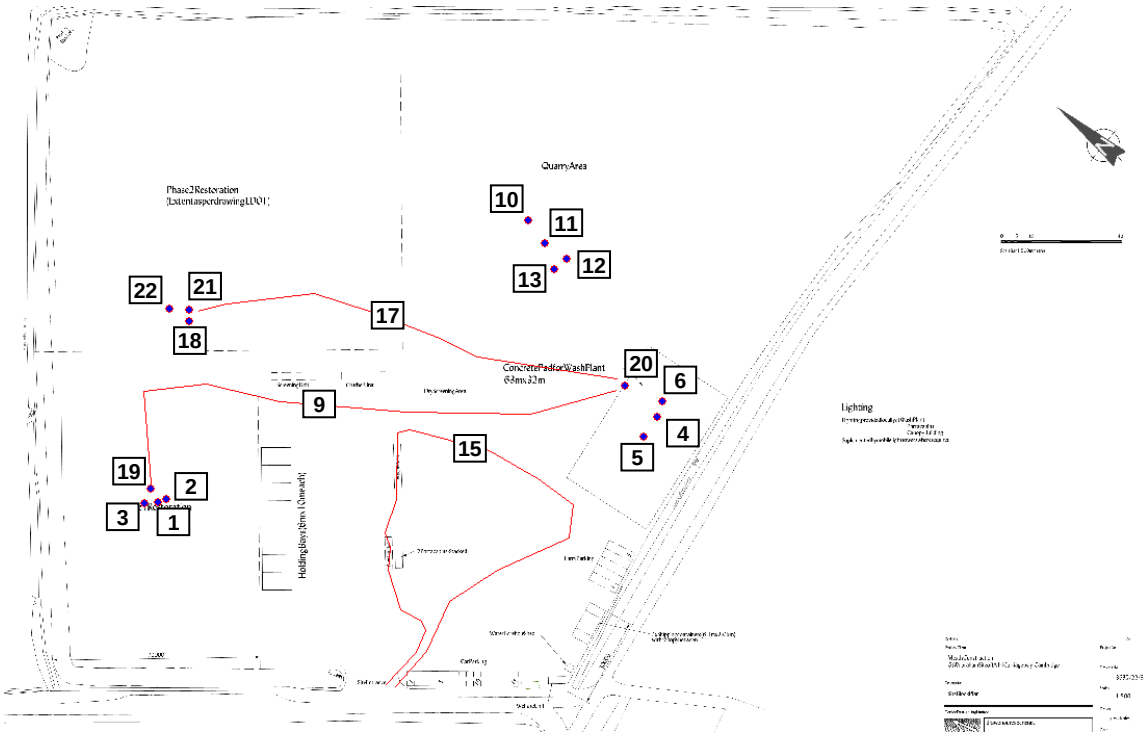
Table E.2: SoundPLAN Assumptions – Scenario 2

Plant Item / Description [Plan Reference]*	Grid Reference (x, y)	Sound Power Level dB L_{WA}	Source Height (m)	On time
HGV movements (recycling and infilling) [15]	556460.73, 254572.16 to 556458.84, 254575.07	104 (62 per metre at 15 km/h)	2	24 per hour
Screener (dry recycling) [1]	556519.85, 254663.62	113	3.5	100%
Excavator (dry recycling) [2]	556520.78, 254654.75	102	2	100%
Dust suppression (dry recycling) [3]	556522.47, 254649.75	109	2	50%
Dump truck (dry recycling) [19]	556478.52, 254618.40	107	2	33%
Dump truck (dry recycling to wash plant) [9]	556479.63, 254611.62 to 556583.78, 254576.47	65/metre	2	100%
Wash plant (wet recycling) [4]	556585.22, 254560.31	83	5	100%
Loading shovel at wash plant [5]	556577.28, 254559.70	107	2	33%
Screener at wash plant [6]	556590.35, 254562.22	108	3.5	100%
Loading shovel (dry recycling) [21]	556474.30, 254615.17	107	2	33%
Dump truck at wash plant [20]	556586.53, 254575.07	107	2	33%
Tractor and harrowing discs (quarry) [10]	556609.33, 254634.73	104	2	100%
Loading shovel (quarry) [11]	556606.86, 254625.64	107	2	50%
Screener (quarry) [12]	556607.37, 254616.73	108	3.5	100%
Excavator (quarry) [13]	556602.07, 254617.80	102	2	100%
Dump truck (wash plant to infilling) [17]	556586.75, 254578.85 to 556516.94, 254701.65	65/metre	2	100%
Tipping of infill [18]	556512.51, 254701.64	106	1	10%
Dump truck in infill area [23]	556515.54, 254703.94	107	2	33%
Dozer (infilling) [22]	556511.54, 254709.23	107	2	100%

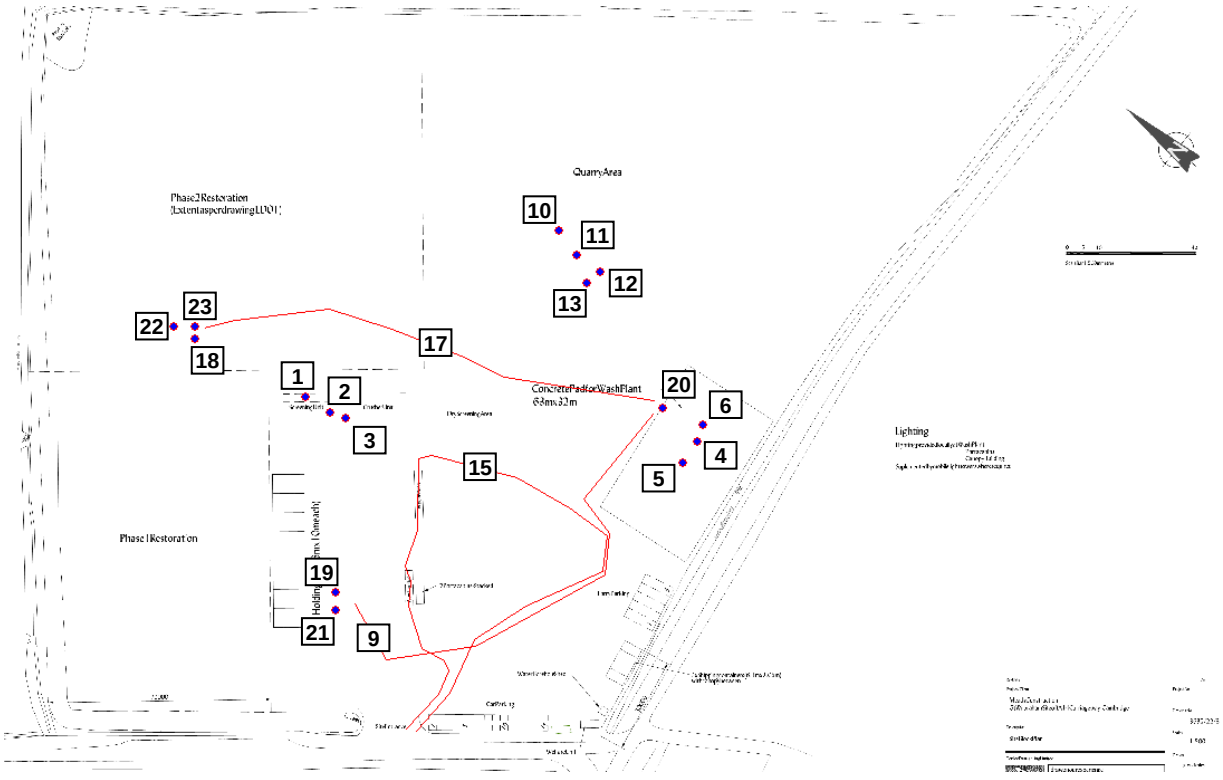
* See Plan E.2 for noise source locations. Note these are the object references as allocated in SoundPLAN, numbering is not sequential (i.e. there are not noise sources with object reference 14, 15, 16 etc).

Appendix E (continued)

Plan E.1: SoundPLAN Assumptions – Scenario 1



Plan E.2: SoundPLAN Assumptions – Scenario 2



Appendix E (continued)

Additional information requested by the Environment Agency as set out in the online document "*Noise impact assessments involving calculations or modelling*" for noise calculations is set out in the following tables.

Table E.3: General Information You Must Provide

Information	Comment
The site location and layout	See plans in Appendix B
Your proposed activities and sources of any noise	See description in Section 2.1, Section 5.2 and Section 6.
Local receptors and reasons for selection	Isolated dwellings are located around the site with the closest being to the south-west of the site within approximately 500m of the site entrance at West Wratting Valley Farm and Valley Farm Cottage. The locations were chosen as they are the nearest residential dwellings to the site.
Your noise remediation approach	Mitigation measures are set out in Section 7.
Map showing the site and surrounding area including receptors	See plans in Appendix B.
Site plan including the site boundary	See plans in Appendix B
Full noise survey report if you have carried out a BS 4142 assessment	See in particular Section 6 and Appendix D.
Description of the noise mitigation measures you propose using and supporting evidence, such as the manufacturers' engineering specification for items that mitigate noise emissions, or calculations of the screening effect of barriers.	See Section 7. Barrier calculations have been undertaken within the SoundPLAN noise mapping software, following ISO9613-2.

Table E.4: Receptor Information

Information	Receptor	
	West Wratting Valley Farm	**Valley Farm Cottage**
Grid references	556138.42, 254202.65	556018.39, 254400.72
Addresses or other identification	N/A	N/A
Number of storeys	2	2
Sensitivity	High	High
BS4142 background sound level L_{A90}	See Table 4.1 (July 2021) and Table 4.2 (January 2024)	
Specific and rating levels for site activities	See Table 6.1 and Table 6.2 and Appendix D.	
Rationale for applying or not applying acoustic penalties	See Section 6.1 and Appendix D.	
Numerical impacts	See Table 6.1 and Table 6.2 and Appendix D.	

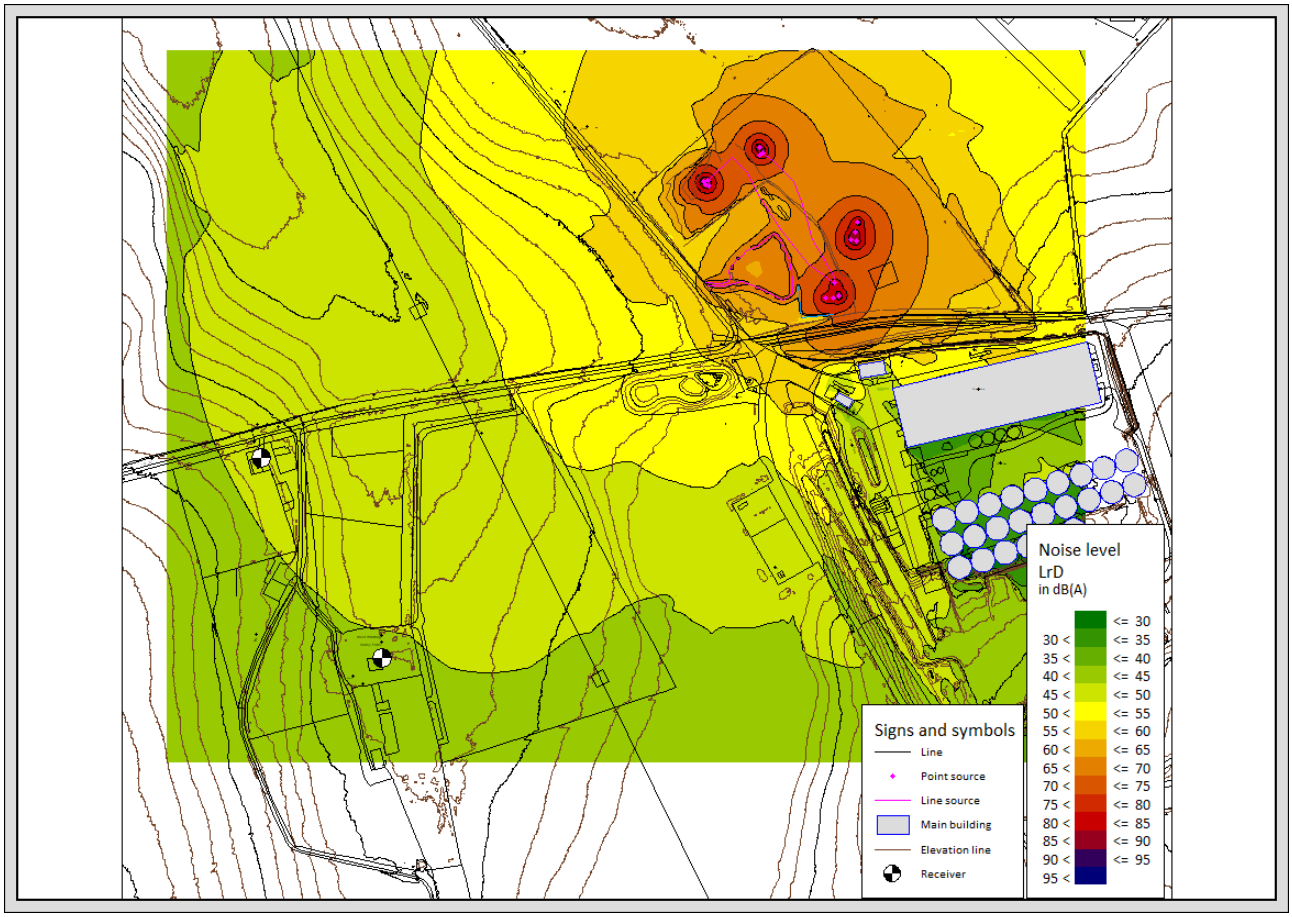
Appendix E (continued)

Table E.5: Noise Data You Must Provide

<table>
<tr><td colspan="6">Fixed and mobile plant</td></tr>
<tr><td>Description</td><td>Grid references</td><td>Referenced or derived sound power levels</td><td>Height</td><td>Directivities</td><td>Operating times</td></tr>
<tr><td colspan="6">The information for all fixed and mobile plant is provided in Table E.1 for Scenario 1 and Table E.2 for Scenario 2. None of the noise sources have been entered with a specific source directivity and are therefore assumed to be omnidirectional sources.</td></tr>
<tr><td colspan="6">Noise emitting buildings</td></tr>
<tr><td colspan="6">There are no noise emitting buildings in the noise model.</td></tr>
<tr><td colspan="6">Aperture emissions</td></tr>
<tr><td colspan="6">There are no noise emitting buildings in the noise model.</td></tr>
<tr><td colspan="6">Site traffic</td></tr>
<tr><td>Description</td><td>Grid references for site roads</td><td colspan="2">Vehicle sound power levels</td><td>Traffic numbers</td><td>Traffic speed</td></tr>
<tr><td colspan="6">The information for all HGV routes within the site is provided in Table E.1, Table E.2 and the routes are shown on Plan E.1 and Plan E.2..</td></tr>
<tr><td colspan="6">Site acoustic barriers</td></tr>
<tr><td>Description</td><td>Grid references at ends</td><td colspan="2">Construction details</td><td>Thicknesses</td><td>Height(s)</td></tr>
<tr><td colspan="6">Scenario 1</td></tr>
<tr><td>Wash plant barrier</td><td>556550.63, 254571.48
to
556553.83, 254540.10
to
556585.72, 254544.02</td><td colspan="2"><table><tr><th></th><th>Reflection loss [dB]</th><th>Absorption coeff.</th><th>Reflection coeff.</th></tr><tr><td>Left</td><td>1.0</td><td>0.206</td><td>0.794</td></tr><tr><td>Right</td><td>1.0</td><td>0.206</td><td>0.794</td></tr></table></td><td></td><td>4</td></tr>
<tr><td colspan="6">Scenario 2</td></tr>
<tr><td>Wash plant barrier</td><td>556550.63, 254571.48
to
556553.83, 254540.10
to
556585.72, 254544.02</td><td colspan="2"><table><tr><th></th><th>Reflection loss [dB]</th><th>Absorption coeff.</th><th>Reflection coeff.</th></tr><tr><td>Left</td><td>1.0</td><td>0.206</td><td>0.794</td></tr><tr><td>Right</td><td>1.0</td><td>0.206</td><td>0.794</td></tr></table></td><td></td><td>4</td></tr>
<tr><td>Dry recycling barrier</td><td>556494.20, 254657.61
to
556517.60, 254628.44</td><td colspan="2"><table><tr><th></th><th>Reflection loss [dB]</th><th>Absorption coeff.</th><th>Reflection coeff.</th></tr><tr><td>Left</td><td>1.0</td><td>0.206</td><td>0.794</td></tr><tr><td>Right</td><td>1.0</td><td>0.206</td><td>0.794</td></tr></table></td><td></td><td>4</td></tr>
</table>

Appendix F – SoundPLAN Noise Plots

Scenario 1:



Appendix F (continued)

Scenario 2: