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Cavenham Quarry, Suffolk
Application for Planning Permission
for Soils Wash Plant

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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

Revision	Description	Date	Prepared by	Checked by
-	First Draft	30/11/2023	R Storey & S Large	A Molyneux
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Contents

1 Introduction

Allen Newport Limited are submitting a planning application to Suffolk County Council for the installation and operation of a soils wash plant on their site at Cavenham in Suffolk.

The soils wash plant is to be located to the north-east of the current processing plant location to the south south-west of the currently permitted extraction/ infilling area of the site within the existing recycling area.

This report sets out the findings of baseline noise surveys conducted in June, July and August 2023 at positions representative of the closest dwellings to the proposed plant site and reviews the existing site noise limits for the dwellings in relation to the background noise levels observed in June, July and August 2023.

It sets out the calculated noise levels arising from the workings and compares those calculated noise levels with the reviewed site noise limits at the nearest dwellings to the site.

The noise limits are based on current advice from the government contained in the web document "*Planning Practice Guidance (Minerals)*", first published in March 2014, which was published to complement the National Planning Policy Framework (NPPF), dated March 2012.

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

2 Guidance Documents

The various relevant noise guidance documents used in this assessment are detailed below.

2.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010. The aim of the document is to "…*provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion*".

The long term vision of noise policy is to "*Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*".

The long term vision is supported by three aims:

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

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

The Explanatory Note to the NPSE introduces the concepts of observed effect levels with regard to noise.

NOEL (No Observed Effect Level) - this is the level below which no effect can be detected, i.e. below this level there is no detectable effect on health and quality of life due to noise.

LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected due to noise.

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

With regard to the first aim of the NPSE, any noise impacts that are above SOAEL should be avoided.

Where the impact lies somewhere between LOAEL and SOAEL, the second aim of the NPSE requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life. However, as stated in paragraph 2.24 of the Explanatory Note to the NPSE "*This does not mean that such adverse effects cannot occur*".

2.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England. The latest version was updated in September 2023.

At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development.

Section 15 of the NPPF (Conserving and enhancing the natural environment) refers specifically to noise in the following paragraphs:

"*174. Planning policies and decisions should contribute to and enhance the natural and local environment by…*

(e) 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…"

"*185. 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:*

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

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

Paragraph 185(a) also refers to the Explanatory Note to NPSE, 2010.

Mineral sites are considered in Section 17 (Facilitating the sustainable use of minerals) of the NPPF.

"*210. Planning policies should …*

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

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

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

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

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

Technical guidance on noise was originally provided in more detail in the accompanying document "*Technical Guidance to the National Planning Policy Framework*", dated March 2012, which was superseded in March 2014 by the Planning Practice Guidance.

2.3 Planning Practice Guidance Noise

Technical guidance on noise is provided by Planning Practice Guidance, published by the Ministry of Housing, Communities & Local Government. Planning Practice Guidance Noise (PPGN) was published in March 2014 and most recently updated in July 2019. This document provides advice on how planning can manage potential noise impacts in new development. It makes reference to the Explanatory Note of the NPSE and also the NPPF.

Paragraph 005 Reference ID: 30-005-20190722 of the PPGN provides guidance on how to establish if noise is likely to be a concern, including the noise exposure hierarchy which summarises the effects of noise exposure and gives examples of outcomes.

These outcomes can be referred to in the consideration of the effects of impacts and relate to the concepts of observed effect levels with regard to noise introduced in the Explanatory Note to the NPSE (see Section 2.1).

PPGN Noise Exposure Hierarchy

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

2.4 Planning Practice Guidance Minerals

Paragraphs 19 to 22 inclusive of the “Minerals” chapter of the Planning Practice Guidance (PPGM), dated March 2014, are under the heading “Noise emissions” within the section “Assessing environmental impacts from mineral extraction”. These paragraphs are reproduced below.

Paragraph 019 Reference ID: 27-019-20140306 states:

"***How should minerals operators seek to control noise emissions?***

Those making mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste, should carry out a noise impact assessment, which should identify all sources of noise and, for each source, take account of the noise emission, its characteristics, the proposed operating locations, procedures, schedules and duration of work for the life of the operation, and its likely impact on the surrounding neighbourhood.

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;*
- *monitor the resulting noise to check compliance with any proposed or imposed conditions."*

Paragraph 020 Reference ID: 27-020-20140306 states:

"***How should mineral planning authorities determine the impact of noise?***

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.*

In line with the Explanatory Note of the Noise Policy Statement for England, 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. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy."

Paragraph 021 Reference ID: 27-021-20140306 states:

"***What are the appropriate noise standards for mineral operators for normal operations?***

Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq, 1h (free field).

For operations during the evening (1900-2200) the noise limits should not exceed the background noise level (LA90,1h) by more than 10dB(A) and should not exceed 55dB(A) LAeq, 1h (free field). For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) LAeq,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 bleepers, may also require separate limits that are independent of background noise (e.g. Lmax 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."

Paragraph 022 Reference ID: 27-022-20140306 states:

"***What type of operations may give rise to particularly noisy short-term activities and what noise limits may be appropriate?***

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

Increased temporary daytime noise limits of up to 70dB(A) LAeq 1h (free field) for periods of up to eight weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.

Where work is likely to take longer than eight weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum."

2.5 Local Authority

Suffolk Minerals and Waste Local Plan

Policy GP4 "General environmental criteria" states:

"Minerals and waste development will be acceptable so long as the proposals, adequately assess (and address where applicable any potentially significant adverse impacts including cumulative impacts) on the following:

… j) noise and vibration;"

Cavenham Quarry is listed in Policy MP2 as a proposed site (Site M4) for sand and gravel extraction. The Local Plan has allocated the land to the west of the existing Quarry for sand and gravel extraction along with the subsequent restoration of the land using inert materials and the establishment of a replacement recycling facility. The existing Quarry has also been put forward to allow for an alternative restoration scheme using inert materials.

Policy MS4 contained within the Local Plan provides a detailed description of the site characteristics and outlines what issues will need to be addressed within a planning application. Policy MS4 states that development will be acceptable at Cavenham Quarry providing that proposals adequately address (amongst other factors) " *g) the provision of measures to mitigate noise*".

At paragraph 11.25 of the Local Plan, within discussion regarding the Cavenham site, it is stated:

"Noise

11.25 Assuming standard mitigation measures such as the use of earth bunds as barriers, no other noise mitigation measures are required."

Existing Planning Permissions

Cavenham Quarry falls under the jurisdiction of the Suffolk County Council and current operations are undertaken in accordance with planning permission Ref. SCC/0064/20F dated 24 December 2020, however this permission excludes a condition relating to noise.

However, the previous two planning permissions granted by Suffolk County Council on 21 September 2016 (Application No: SCC\0123\16F and SCC\0124\16F) include conditions relating to noise.

Application No: SCC\0123\16F contains conditions on "*Noise Control Limits*" (see below) whereas Application No: SCC\0124\16F contains conditions on "*Noise*" ("*Effective Silencers*" and "*Loudspeakers*"), as these do not relate to community noise limits they have not been reproduced below.

Conditions 21 to 27 within Application No: SCC\0123\16F relate to noise, with 21 and 22 headed "*Noise Control Limits*". Conditions 21 to 27 are reproduced below:

"21 Noise from soil stripping, removal of spoil heaps, bund formation and landforming shall not exceed:

a) 55 dB(A) Leq (1 hour), at locations 2 and 3 identified on Drawing No: F/08/0584-0585-0591A entitled 'F97/027 Cavenham – Noise Monitoring Locations' attached to this permission, or positions as may have been agreed in writing with the Mineral Planning Authority as being representative of those locations, measured at a height of 1.2 metres above ground and at least 10 metres from any reflective surface;

b) 70 dB(A) Leq (1 hour) freefield at Mill Farm House and The Hassocks; and shall be restricted to the hours of 0800 to 1700 Monday-Friday and 0800 to 1300 Saturday. Work shall be restricted to a maximum of eight weeks/year."

"22 Noise from extraction, de-watering, or restoration operations other than bund removal, shall not exceed a level of 45 dB(A) Leq (1 hour) at:

a) Locations 1, 2 and 3 identified on Drawing No: F/08/0584-0585-0591A entitled 'Noise Monitoring Locations' attached to this permission.

b) Mill Farm House and The Hassocks, or representative positions to those locations, measured at a height of 1.2 metres above ground and at least 10 metres from any reflective surface. (For the purposes of this condition the applicant's attention is drawn to the Notes at the end of this permission setting out the monitoring arrangements.)"

"23 Noise from aggregate washing and processing plant, employed at the site shall not exceed a level of 45 dB(A) Leq (1 hour) at location 3 identified on Drawing No: F/08/0584-0585-0591A entitled 'Noise Monitoring Locations' attached to this permission."

"24 Between 1800 and 0700 the de-watering pumps shall be baffled such that noise from the pumps shall not exceed a level of 65 dB(A) Leq (5 minutes) at a distance of 10 metres from the installation."

"25 The noise emitted at any time from the de-watering pumps shall not contain any of the features described in BS4142:1997 such as any distinguishable, discrete continuous note, (whine, hiss, screech, hum etc), or distinct impulses (bangs, clatters, clicks or thumps)."

26 All site plant shall be fitted with broadband sound reversing alarms.

27 Silencers shall be fitted to, used and maintained in accordance with manufacturers' instructions on all vehicles, plant and machinery including dump trucks used on the site. No machinery shall be operated with the covers open or removed."

The locations referred to as 1, 2 and 3 are the two nearest residential locations at Mill Farm House and The Hassocks as well as an ecological receptor at Cavenham Heath.

The currently permitted hours of operation, as set out in Condition 6 of the latest planning permission for the site granted by Suffolk County Council on 24 December 2020 (Application No: SCC\0064\20F), are:

"6. *No operations authorised or required by this permission including servicing and plant maintenance shall be carried out except between the following times:*

a) Monday to Friday 0700-1800;
b) Saturday 0700-1300;
c) No working on Sundays and bank holidays.

The above time restrictions shall not apply to water pumping and environmental monitoring.

This condition shall not apply in case of emergency with life, limb or property are in danger. The Minerals Planning Authority shall be notified in writing, as soon as possible after the occurrence of any such emergency."

It is proposed that the soils wash plant will only operate during those hours.

3 Site Description

The site is to the north of Cavenham, east of Tuddenham St Mary, southwest of Icklingham and approximately ten kilometres to the north west of Bury St Edmunds in Suffolk. The existing site entrance is from Cavenham Road, approximately midway between Cavenham and Tuddenham St Mary. Cavenham Heath National Nature Reserve is to the north west of the site.

As shown on the plan included in Appendix B, the proposal is for a soils wash plant located to the north-east of the existing minerals wash plant within the current recycling area.

The planning application will seek permission to allow for a soils wash plant to be operated alongside the continued use of the existing processing plant, recycling facility ancillary infrastructure and access as well as the current infilling restoration of the mineral extraction area (and potentially the works in the proposed western extension that is yet to be granted planning permission).

The nearest residential properties to the site are to the east and north east, namely Mill Farm House and The Hassocks at which site noise limits already exist. The next nearest residential properties (where there are no current site noise limits) lie to the north / north east of the site in Icklingham and to the south of the site in Cavenham.

Six locations have been selected for site noise calculations as representative of the nearest receptors to the site:

1 Tuddenham House, Cavenham; (junction with The Street);

2 Mill Farm House;

3 The Hassocks;

4 Dwellings by Heygates Mill, Icklingham;

5 West Street, Icklingham; and

6 Cavenham Heath (ecological receptor).

These site noise calculation locations as well as the baseline survey locations are shown on the plan in Appendix C.

4 Assessment Methodology

4.1 Determining Receptor Sensitivity

The consequence of a noise impact will be dependent on the receptor and its sensitivity. A summary of the sensitivity of potential noise receptors is provided in the table below.

Receptor Sensitivity & Methodology for Assessing Sensitivity of Receptors

Sensitivity	Example of Receptor
Very High	World Heritage Sites Grade I Listed Buildings
High	Residential properties (permanent tenants) and schools and hospitals
Medium	Transient residential receptors such as users of hotels, users of public footpaths
Low	Commercial premises
Negligible	Assets with very little or no surviving cultural heritage interest

This assessment is focused on the residential properties closest to the proposed site which are all considered as being of high sensitivity.

The receptors of high sensitivity considered in this assessment are as follows:

- Tuddenham House, Cavenham (junction with The Street);
- Mill Farm House;
- The Hassocks;
- Dwellings by Heygates Mill, Icklingham; and
- West Street, Icklingham.

Additional consideration was also given to the non-residential ecological receptor at Cavenham Heath which is considered to be of medium sensitivity. Whilst there are no established noise thresholds for noise impacts from minerals operations on wildlife, any noise impact on human visitors to these areas will be of a transient nature, similar to users of a public footpath.

4.2 Determining Impact Magnitude

The criteria for assessing magnitude of impact are outlined in the following table. These are based on long established noise indicators taken from the recommendations for acceptable noise levels in the guidance document Planning Practice Guidance (Minerals).

Assessing Magnitude of Impact for Calculated Site Noise Levels

Impact Magnitude	Typical Criteria Descriptors	
	Routine Operations	**Temporary Operations**
Slight	≤ 55 and ≤ LA90+10	≤ 55 and ≤ LA90 + 10
Moderate	≤ 55 and > LA90+10	≤ 70 and ≤ 8 weeks per year
Substantial	> 55 and > LA90+10	> 70 and > 8 weeks per year

The Impact Magnitudes defined as "*slight*", "*moderate*" and "*substantial*" correspond to the NOAEL, LOAEL and SOAEL referred to in the Explanatory Note to the Noise Policy Statement for England (NPSE).

4.3 Determining Significance and Nature of Effects

The significance of effect is determined by combining the magnitude of impact with the sensitivity of the receptor.

In this assessment any significance of effect that is defined as being above moderate/minor (i.e. moderate, major/moderate or major) is considered to be adverse. Any significance of effect below and including moderate/minor is considered to represent a "*good standard of amenity*".

Significance of Effects Matrix

		Magnitude of Impact			
		Substantial	**Moderate**	**Slight**	**Negligible**
Sensitivity	**Very High**	Major	Major	Major/Moderate	Neutral
	High	Major	Major/Moderate	Moderate/Minor	Neutral
	Medium	Major/Moderate	Moderate	Minor	Neutral
	Low	Moderate/Minor	Minor	Minor/Neutral	Neutral

4.4 Assessment Assumption Limitations

The greatest limitation of the assessment and the largest level of uncertainty is whether the proposed activity will give rise to the calculated noise level at the receiver locations in practice.

The calculations and assessment have been based on all components of the soil wash plant operations taking place simultaneously and for 100% of each hour during the expected working daytime periods to represent a realistic worst case scenario (the loading shovel use is split evenly between the plant and the stockpiles). In reality, this situation is unlikely to occur and noise levels would, in all likelihood, be lower than those presented in the assessment.

For the consideration of the ongoing permitted site operations as part of examining the cumulative impact of the proposals, the various elements of the recycling, infilling and mineral wash plant operations have also been included as taking place for 100% of each hour apart from tipping of infill material which was included as occurring for 10% of the time.

It is not expected that the number of HGV movements will increase with the addition of the soils wash plant as the site is already permitted to import the material that will be fed into the plant. It has therefore been assumed that HGV movements on the access road are up to 12 per hour and has been included in the assessment as such.

The site noise calculations do not include any allowance for air absorption, which would be minimal in any case and make no difference to the assessment.

The average background sound level was used in the assessment as the surveys covered a range of wind directions including two days with a westerly component (which would be expected most of the time) and this was considered to be representative of the background sound levels that would be normal for the properties in the vicinity of the site.

5 Baseline Noise Surveys

5.1 Measurement Description

Baseline noise surveys were conducted on three days at four locations representative of the nearest noise sensitive properties to the plant site for which existing site noise limits are in place.

Manned baseline noise surveys were undertaken during the daytime on Saturday 24 June 2023, Friday 07 July 2023 and Tuesday 15 August 2023 at:

Location A: Tuddenham House, Cavenham (junction with The Street);

Location B/B': Mill Farm House / The Hassocks;

Location C: Dwellings by Heygates Mill; and

Location D: West Street, Icklingham.

A data logging sound level meter was also installed on site for the period Saturday 24 June to Friday 07 July 2023 to obtain more extensive baseline noise data.

The details of these surveys are presented in Appendix D and Appendix F with the full results of the sample measurements in Appendix E and a graphical presentation of the installed sound level meter data in Appendix G.

During the manned daytime noise surveys in June, July and August 2023, the noise climate was affected by distant and local road traffic noise, aircraft movements (some associated with RAF Mildenhall military base), birds, local agricultural activity and plant associated with the mill at Icklingham.

The Cavenham site is a working quarry and as such baseline surveys were designed to minimise the influence of the existing works on measured background sound levels in the area.

The first survey on Saturday 24 June 2023 was arranged such that monitoring could be undertaken before and after the processing plant on site had stopped operating allowing assessment of whether site noise was audible in the community and influencing background sound levels. However, the processing plant and site shut down early and all sample measurements were undertaken without the site operating.

It is also noted that as a result, the majority of the Saturday survey period coincides with times of the day that the site is not proposing to operate.

The second survey on Friday 07 July 2023 was arranged such that the measurements could be undertaken before and after the processing plant (and majority of site operations) had stopped operating. It was arranged with the site that operations would stop earlier than normal at 5pm. This comparison allowed an assessment of site audibility at community

locations and whether there was any significant influence on background sound levels. The findings of the July survey indicated that the background sound levels at the sample monitoring locations were not influenced by site noise, which was generally inaudible at all locations.

The third survey on Tuesday 15 August 2023 was undertaken to gain additional background sound level data during periods when the site would normally be operating, with confidence that baseline sound levels would not be influenced by existing operations on site based on the findings of the July survey.

A sound level meter was also installed on site in a location to minimise influence from site operations and gain additional baseline sound level data outside of the site's operating hours. The measured sound levels from the period approximately 2 hours after the site ceases to operate (i.e. Monday to Friday 6-8pm and Saturday 1-3pm) have been used to supplement the assessment of typical baseline sound levels in the locality.

5.2 Results

The detailed results of the sample measurements are set out in Appendix E with the data from the installed sound level meter presented graphically in Appendix G.

A summary of the average background $L_{A90,15\ minute}$ and ambient $L_{Aeq,\ 15\ minute}$ levels at each position, is presented in the following table.

The parameters reported are the statistical measure, $L_{A90,T}$, which is taken as the background sound level and the equivalent continuous sound level, $L_{Aeq,T}$, taken as the ambient noise level. An explanation of the noise units presented is given in Appendix A.

Position	**Average Background Level dB $L_{A90,15\ minutes}$**	**Average Ambient Level dB $L_{Aeq,\ 15\ minutes}$**
A Tuddenham House, Cavenham	37	51
B/B' Mill Farm House / The Hassocks	38	50
C Heygates Mill	49	62
D West Street, Icklingham	38	51
Install (on site)	37	45

The average background sound levels measured at locations A, B/B', D and the installed sound level meter on site are very similar. At Location C, the sound environment was dominated by local road traffic noise and broadband plant noise from Heygates Mill at Icklingham.

The additional data gained from the installed sound level meter on site confirms that the background sound levels (L_{A90}) measured in the community (including during periods when the site was operating) are representative of periods when the site is not operating. The data is therefore suitable for use in this assessment as uninfluenced baseline.

6 Evaluation and Analysis of Noise Data

Paragraph 21 of the Planning Practice Guidance states:

"***What are the appropriate noise standards for mineral operators for normal operations?***

Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq, 1h (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level (LA90,1h) by more than 10dB(A) and should not exceed 55dB(A) LAeq, 1h (free field). For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) LAeq,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 bleepers, may also require separate limits that are independent of background noise (e.g. Lmax 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."

The site noise limits for the ongoing (routine / normal) operations are reviewed based on the web document “Planning Practice Guidance” paragraph 21 as follows:

Position	June, July, August 2023 Average Measured Background Level dB $L_{A90, 15min}$	PPGM Site Noise Limit dB $L_{Aeq, 1 hour, free field}$	Existing Site Noise Limit dB $L_{Aeq, 1 hour, free field}$
1. Tuddenham House	37	47	-
2. Mill Farm House	38	48	45
3. The Hassocks	38	48	45
4. Heygates Mill	49	55	-
5. West Street	38	48	-

It is recommended that the site noise limits based on PPGM advice are adopted as part of a new noise condition, however if the noise control limits previously in place for the isolated dwellings at Mill Farm House and The Hassocks are retained, the PPGM limits for the other dwellings should be added to any new condition.

7 Calculation of Site Noise Levels

7.1 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 of BS 5228 for Construction and Open site noise; Planning Practice Guidance to the National Planning Policy Framework 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. Proper allowance can be made for these variables in order to calculate site noise levels.

The Planning Practice Guidance for the NPPF in paragraph 19 states those making development proposals should consider “*estimating the likely future noise from the development and its impact on the neighbourhood of the proposed operations*”.

The Planning Practice Guidance published in March 2014 does not contain details of noise prediction methods and in the absence of detailed guidance in the NPPF, the calculations in this report are based on the methods contained in ISO 9613-2:1996 “Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation”.

Site noise calculations of the operation of the soils wash plant and associated mobile plant/HGV movements were 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 receptors in the vicinity of the site.

The following scenario was modelled:

- Operation of the soils wash plant in isolation (07:00 to 18:00 hours).

An additional scenario was modelled of all site operations including the soils wash plant (07:00 to 18:00 hours) for the consideration of cumulative impact.

The calculations were undertaken as a worst case scenario with the operation of the wash plant and the associated loading shovel as taking place for 100% of the assessment period with the use of the loading shovel evenly split between the plant and the stockpile areas.

It is expected that there would normally be up to 12 HGVs coming into/leaving the site during a typical hour and this is not to increase, so HGV movements have been included as 12 one-way movements into and out of the site per hour.

The calculations assume that there is on average 90% soft ground across the calculation area.

Details of plant noise surveys undertaken on site on Thursday 21 May 2020 (to inform the existing minerals wash plant sound power levels) and at another site where a plant of the same design was measured on Tuesday 22 May 2018 (to inform the proposed soils wash plant sound power levels) are presented in Appendix H.

The sound power level data and assumptions used for the SoundPLAN noise model are presented in Appendix I.

The SoundPLAN daytime noise contour plot covering the assessment area relating to the operation of the soils wash plant is presented in Appendix J along with a SoundPLAN daytime noise contour plot of the whole site operations including the soils wash plant (for cumulative impact).

7.2 Calculated Site Noise Levels – Residential Receptors

Site noise levels for the operation of the fixed and mobile plant for the soils wash plant are presented in the following table for comparison with the existing/reviewed site noise limits. Calculated site noise levels are also presented for all site operations including the proposed soils wash plant for the consideration of cumulative impact. The table gives the current site noise limits where they exist for dwellings and the suggested PPGM site noise limit in brackets.

Location	**Calculated Site Noise Levels dB $L_{Aeq, 1\ hour, free\ field}$**		**Site Noise Limit (PPGM Limit) dB $L_{Aeq, 1\ hour, free\ field}$**
	Soils Wash Plant	**Whole Site**	
1. Tuddenham House	31	36	N/A (47)
2. Mill Farm House	30	45	45 (48)
3. The Hassocks	26	39	45 (48)
4. Heygates Mill	24	33	N/A (55)
5. West Street	25	35	N/A (48)

N/A No site noise limit set in planning permission SCC\0123\16F for this dwelling.

The calculated site noise levels are equal to or below the existing site noise limits (and potential PPGM site noise limits) at all the receiver locations considered.

Note that inclusion of the dense foliage between Mill Farm House and the site (as was the case in the most recent noise assessments for the site) results in a calculated whole site noise level at that receptor of 43 dB $L_{Aeq, 1\ hour\ free\ field}$ (30 dB $L_{Aeq, 1\ hour\ free\ field}$ for the soils wash plant operation alone).

8 Likely Significant Environmental Effects

8.1 Operational Phase (Extraction and Processing)

Cavenham Quarry falls under the jurisdiction of the Suffolk County Council and current operations are undertaken in accordance with planning permission Ref. SCC/0064/20F dated 24 December 2020, which does not include any conditions relating to noise.

The previous permissions for the site dated 21 September 2016 contain conditions regarding noise. Application No: SCC\0123\16F contains conditions on “Noise Control Limits” and Application No: SCC\0124\16F contains conditions on “Noise” (“Effective Silencers” and “Loudspeakers”) with the relevant details presented in Section 2.5.

Site noise limits have been reviewed in line with the provisions of the web document “*Planning Practice Guidance*” for Minerals and although it could be considered that the previous site noise limits for the properties closest to the site are still appropriate, there are only limits in place for the two nearest residential locations. PPGM site noise limits have been suggested for all the properties including those for which there are no extant limits.

Site noise calculations have been undertaken for the five chosen assessment locations representative of the nearest dwellings to the plant site.

A comparison of the calculated noise levels at the nearest dwellings for the operation of the proposed soils wash plant and associated mobile plant/HGV movements with the existing and PPGM site noise limits along with an assessment of impact is shown in the following table. The calculated site noise levels and the existing and PPGM site noise limits in the tables below are all in terms of dB $L_{Aeq\ 1\ hour\ free\ field}$.

Calculated Site Noise Levels (Routine Operations) – Soils Wash Plant

Location	Receptor Sensitivity	Calculated Site Noise Level dB $L_{eq,}$ 1hour free field	Existing (PPGM) Site Noise Limit (Routine Operations) dB $L_{eq,\ 1hour\ free\ field}$	Complies with Noise Limit (Y/N)	Magnitude of Impact	Significance of Impact
1. Tuddenham House	High	31	(47)	Y	Moderate/ Minor	Good standard of amenity
2. Mill Farm House	High	30	45 (48)	Y	Moderate/ Minor	Good standard of amenity
3. The Hassocks	High	26	45 (48)	Y	Moderate/ Minor	Good standard of amenity
4. Heygates Mill	High	24	(55)	Y	Moderate/ Minor	Good standard of amenity
5. West Street	High	25	(48)	Y	Moderate/ Minor	Good standard of amenity

The calculated site noise levels for operations associated with the soils wash plant comply with the existing and PPGM site noise limits at all of the chosen assessment locations.

As all the receptors considered are of high sensitivity and the calculated site noise levels comply with the existing and suggested PPGM site noise limits at all the assessment locations, i.e. the calculated site noise levels are less than the representative background noise levels plus 10 dB(A) and therefore represent a slight impact, it is considered that the impact at all the receiver locations is identified as being "*Moderate/Minor*" and that a good standard of amenity can be achieved.

As stated in Section 4.2, the Impact Magnitudes defined as "*slight*", "*moderate*" and "*substantial*" correspond to the NOAEL, LOAEL and SOAEL referred to in the Explanatory Note to the Noise Policy Statement for England (NPSE) and referenced in in Sections 2.1 and 2.3.

As the magnitude of impact has been identified as being "*Slight*" at all receiver locations, the calculated site noise levels at all the assessment locations demonstrates that site noise is up to and below the lowest observed adverse effect level (LOAEL) and well below the significant observed adverse effect level (SOAEL).

As only those impacts identified as having a significant effect would have been taken forward for further consideration of additional mitigation measures, there is no significant residual impact with regard to noise. Additional mitigation has therefore not been considered.

At a distance, noise from machinery used at mineral workings does not usually contain a distinguishable tone nor does it tend to be impulsive. The use of reversing bleepers on site plant is a separate matter. Where reversing sirens or bleepers are used on mobile site plant and could give rise to noise problems, the use of quieter or silent types of alarm or warning devices that are more environmentally acceptable should be explored and is recommended. All mobile plant observed on site during visits in June and July 2023 were fitted with white noise reversing alarms, which are generally considered best practice over tonal alarms.

8.2 Embedded Mitigation

The current plant site is surrounded by stock piles and bunding that provide some screening from the existing operations. The proposed soils wash plant would also benefit from the screening in this area. Further, planning permission reference SCC/0064/20F requires a 3m high noise attenuation bund to be erected to the east of the extraction area during the infilling and restoration operations. This bunding lies to the west of the dwellings at Mill Farm House and The Hassocks and has been included in the modelling for the site.

As noted in the Local Plan Policy MS4 and at paragraph 11.25, development will be acceptable at Cavenham Quarry providing that proposals adequately address the provision of measures to mitigate noise and "*Assuming standard mitigation measures such as the use of earth bunds as barriers, no other noise mitigation measures are required.*"

The calculations in this report include the local topography around the site including existing bunding to the east of the extraction / current infilling and restoration area. It has been demonstrated that acceptable noise levels, compliant with both existing and proposed PPGM noise limit, can be achieved. The assessment therefore demonstrates compliance with the requirements of Local Plan policy.

9 Assessment of Cumulative Impacts

For the purposes of this assessment and the consideration of cumulative noise impact, the currently permitted ongoing operations at Cavenham Quarry have been considered and the calculated site noise levels for the whole site including the soils wash plant operations are presented for comparison with the existing/reviewed site noise limits at the nearest dwellings to the site in the following table:

Location	**Calculated Site Noise Levels dB $L_{Aeq,\ 1\ hour,\ free\ field}$**	**Existing (PPGM) Site Noise Limit dB $L_{Aeq,\ 1\ hour,\ free\ field}$**
1. Tuddenham House	36	(47)
2. Mill Farm House	45	45 (48)
3. The Hassocks	39	45 (48)
4. Heygates Mill	33	(55)
5. West Street	35	(48)

A SoundPLAN noise contour plot for the overall site noise levels is also presented in Appendix I.

The calculated site noise levels for the whole site including the soils wash plant operation comply with the existing and PPGM site noise limits at all five receptors considered.

As described in Section 8.1, as the calculated site noise levels comply with the suggested site noise limits at all the assessment locations, this represents a slight impact and therefore it is considered that the impact at all the receiver locations is identified as being "*Moderate/Minor*" and that a good standard of amenity can be achieved.

As the magnitude of impact has been identified as being "*Slight*" at all receiver locations, the calculated site noise levels at all the assessment locations demonstrates that site noise is up to and below the lowest observed adverse effect level (LOAEL) and well below the significant observed adverse effect level (SOAEL).

During the baseline noise surveys in June, July and August 2023, the operation of Heygates Mill was audible at Mill Farm House and The Hassocks and dominant at the dwellings close to the mill, but was inaudible at the other baseline survey locations.

At dwellings closest to Heygates Mill it is expected that noise from the mill will continue to be the dominant noise source, masking noise from the Cavenham Quarry site. In this respect there is no significant cumulative impact.

At dwellings where Heygates Mill was inaudible, noise from the Cavenham Quarry operations may be audible at times but the receptors will not experience any cumulative impact with the operation of Heygates Mill and as such there is no cumulative impact.

The dwellings Mill Farm House and The Hassocks may experience noise from operations at both Heygates Mill and the Cavenham Quarry site. However, the quarry is an existing site and noise from the site is an established part of the sound environment. The calculated noise levels from the proposed soils wash plant at Mill Farm House and The Hassocks are more than 10dB below the cumulative site noise levels, indicating that the proposed soils wash plant does not contribute significantly to the calculated noise levels at these locations. As such, there is no change to the current situation with regards to cumulative impact at these dwellings with the addition of the soils wash plant.

To the north of the plant site at Cavenham, there is an asphalt plant that is operated by Breedon. This plant is outside the application area and is expected to continue to operate as is currently the case.

During the baseline noise surveys in June, July and August 2023, the operation of the asphalt plant was not audible at the baseline survey locations and does not appear to contribute significantly to the cumulative noise levels at those locations.

In the context of the calculated site noise levels, the locations at which other premises were audible and the level of audibility, it is considered that the additional operation of the soils wash plant concurrently with the existing site operations should have no significant cumulative impact on compliance with the existing and PPGM site noise limits at the receptors considered.

10 Ecological Receptors

The previous two planning permissions dated 21 September 2016 contain noise conditions identified Cavenham Heath NNR as an ecological receptor and stipulates that site noise levels should not exceed 45 dB $L_{Aeq,\ 1\ hour\ free\ field}$ at this location.

The location described as Location 3 in the planning permission dated 21 September 2016 (Application No: SCC\0123\16F) has been used in the site noise calculations with calculated site noise levels for the proposed soils wash plant and the whole site including the proposed soils wash plant of 35 and 44 dB $L_{Aeq, 1 hour free field}$ respectively.

Other ecological receptors in the area are:

- Breckland Farmland SSSI to the south-west of the plant site;
- West Stow Heath SSSI, Breckland SPA and Lackford Lakes SSSI to the east south-east of the site; and
- Deadman's Grave, Icklingham SSSI to the north north-east of the site.

These ecological receptors are all covered by the SoundPLAN noise contour plots presented in Appendix J with the range of calculated noise levels at those ecological receptors (for the soils wash plant in isolation and the whole site including the soils wash plant) presented in the following table.

Ecological Receptor	**Calculated Noise Level, dB $L_{Aeq, 1 hour free field}$**	
	Soils Wash Plant	**Whole Site**
•Breckland Farmland SSSI	30 to 45	35 to 45
•West Stow Heath SSSI	<30	<35
Breckland SPA	<30	<35
Lackford Lakes SSSI	<30	<35
Deadman's Grave, Icklingham SSSI	<35	<35

The calculations show that at all nearby ecological receptors the site noise levels for the proposed soils wash plant and the whole site including the proposed soils wash plant will be equal to or (in most cases) significantly below the site noise limit for Cavenham Heath NNR ecological receptor set in Application No: SCC\0123\16F of 45 dB $L_{Aeq, 1 hour free field}$. Additional mitigation has therefore not been considered.

In terms of external amenity for visitors to these ecological sites, the receptor sensitivity is considered to be 'medium', i.e. similar to a public footpath. As the receptor sensitivity is 'medium' and the calculated noise levels will be equal to or significantly below the existing noise limit for Cavenham Heath NNR ecological receptor (having a 'slight' impact magnitude) the significance of effect is 'minor'. It is concluded that a good standard of amenity will be retained for users of the ecological sites.

11 Summary and Conclusions

This report sets out the findings of a noise assessment to accompany a planning application for the installation and operation of a soils wash plant on the Allen Newport Ltd site at Cavenham Quarry in Suffolk.

The soils wash plant is to be located to the north-east of the existing minerals wash plant to the south south-west of the current extraction / infilling area, within the existing recycling area.

This report sets out the findings of baseline noise surveys conducted in June, July and August 2023 at positions representative of the closest dwellings to the plant site including the two nearest locations for which site noise limits are already in place.

Current guidelines on noise are contained in the web document "*Planning Practice Guidance (Minerals)*", first published in March 2014.

The report reviews the existing site noise limits in relation to the background noise levels observed in June, July and August 2023 concluding that although the existing site noise limits could be retained, PPGM site noise limits have been suggested based on current background noise levels and including limits for the remaining baseline survey locations for which no limits are in place.

Site noise calculations have been undertaken for five residential locations, taken to be representative of the nearest dwellings to the plant site. Site noise calculations have also been undertaken for ecological receptors in the vicinity of the site. The calculated site noise levels are presented for inspection and comparison with the existing and PPGM site noise limits.

The calculated site noise levels for operation of the soils wash plant and associated mobile plant/HGV movements comply with the both the existing and the PPGM site noise limits at all the assessment locations.

The assessment demonstrates that the magnitude of noise impact of the proposals will be "*Slight*" and therefore below the lowest observed adverse effect level (LOAEL) and well below the significant observed adverse effect level (SOAEL).

Cumulative noise impact has also been considered and it is concluded that site noise levels with the addition of the soils wash plant operations would not adversely impact the site's ability to comply with the existing and PPGM site noise limits and that there is no significant cumulative noise impact with other commercial / industrial operations in the area.

Since the proposed soils wash plant operations conform to the advice set out in the Planning Practice Guidance (Minerals) with regard to site noise limits and have been shown to have a noise impact below the lowest observed adverse effect level (LOAEL), it is considered that the plant can be operated while keeping noise emissions to within environmentally acceptable limits.

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

Appendix A – Glossary of Acoustic Terms

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)

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.

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 $L_{A90,T}$.

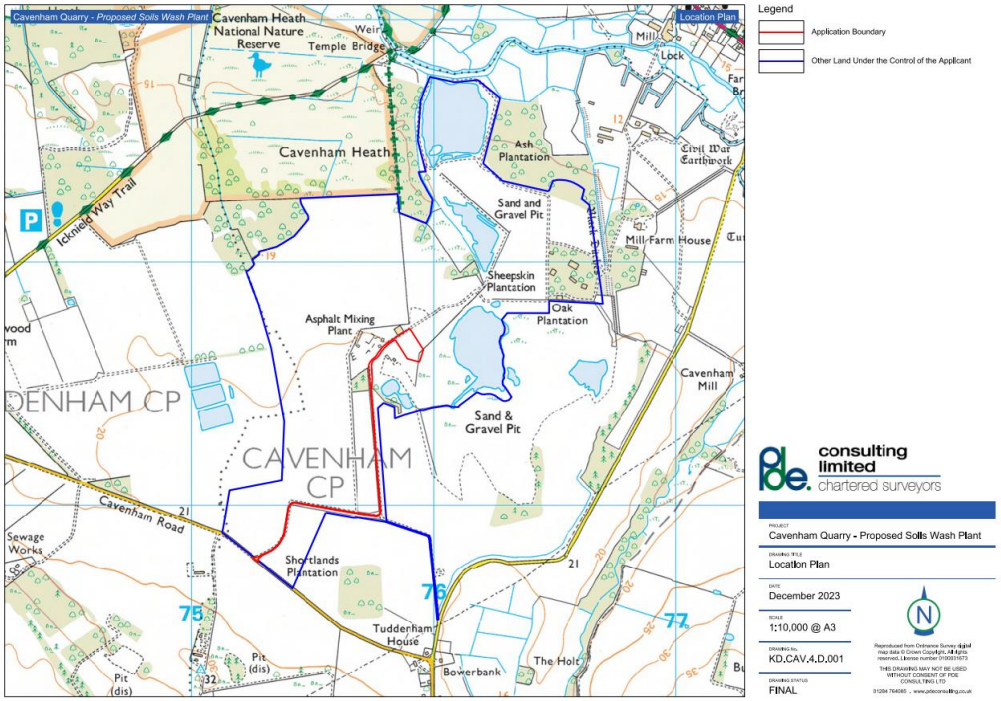
$L_{A01,T}$ is the 'A'-weighted level exceeded for 1% of the time interval T and is often used to gives an indication of the upper maximum level of a fluctuating noise signal.

$L_{A10,T}$ 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.

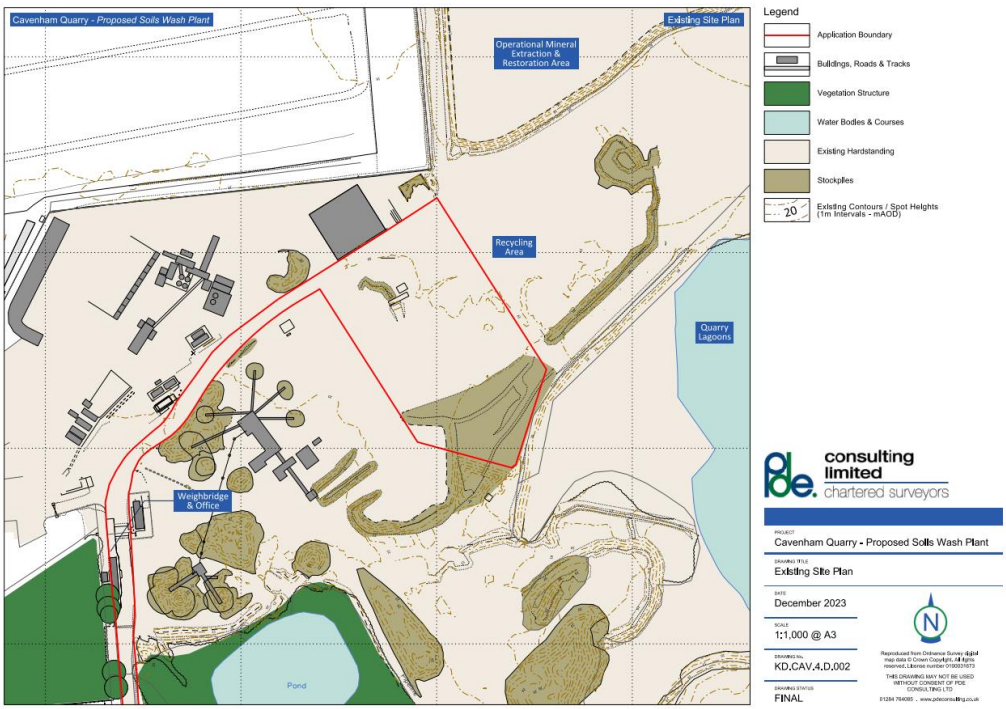
$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

Appendix B – Plans Showing Site Layout

Location Plan

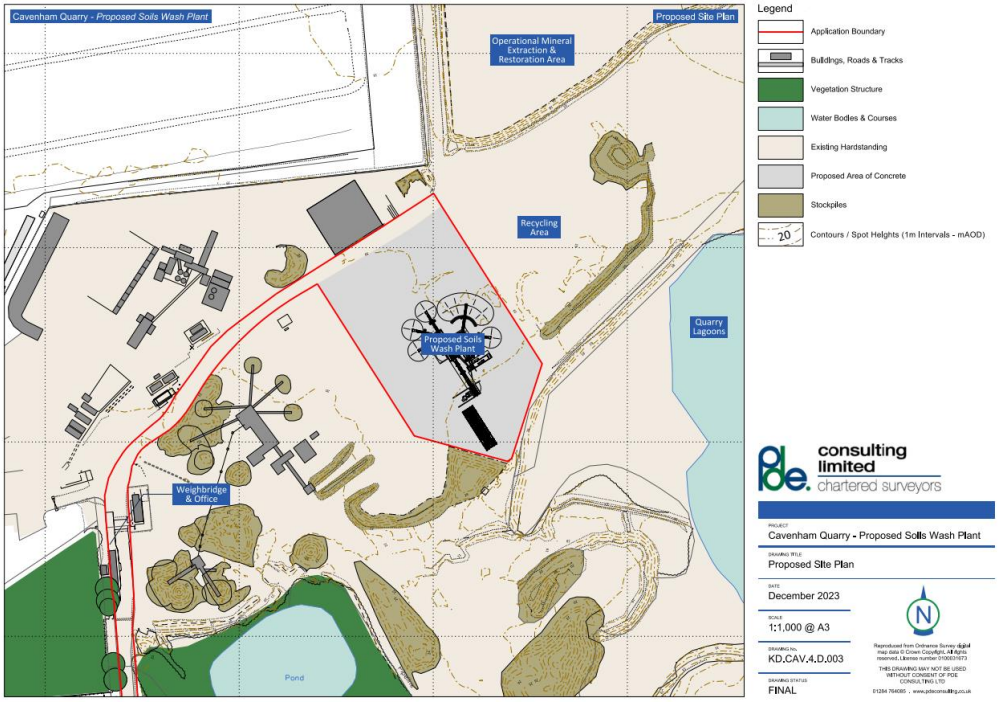


Current Site Layout

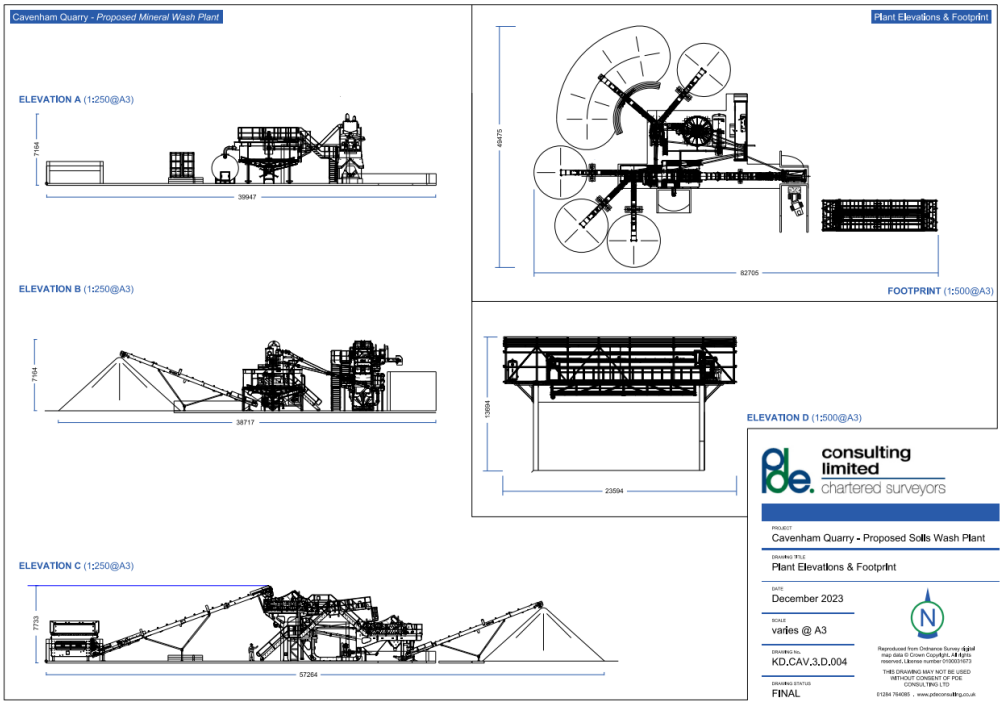


Appendix B (continued)

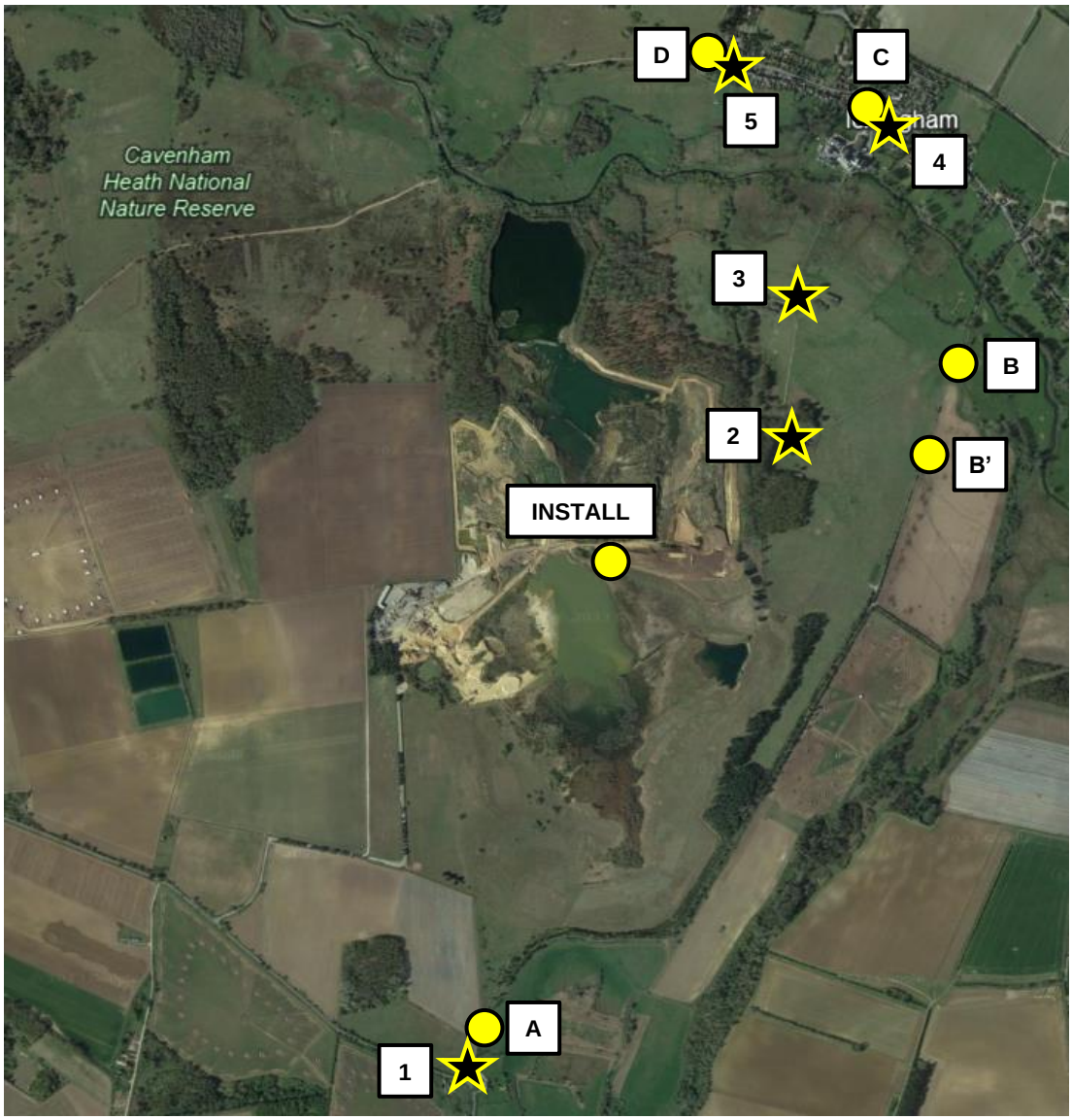
Proposed Site Layout



Proposed Elevations



Appendix C – WBM Noise Survey Locations



●	Measurement location	★	Assessment location

Location			Description
1	A	Tuddenham House	In field entrance to north of Tuddenham House.
2	B	Mill Farm House	At gated entrance to track to Mill Farm House
2	B'		In layby to south of gated entrance to track to Mill Farm House
3	B/B'	The Hassocks	See above
4	C	Heygates Mill	Along access road to Heygates Mill, adjacent St James Church
5	D	West Street	Opposite 55 West Street at junction with quiet lane.
/	Install	On Site	Middle of site away from main site activity, approx. 570 NE of processing plant

Appendix D – Sample Survey Details

Dates and Locations of Surveys

12:35-15:10, Saturday 24 June 2023;

14:50-17:55, Friday 07 July 2023; and

10:25-13:00, Tuesday 15 August 2023.

At Locations A to D as shown in the plan and described in Appendix C

Surveys carried out by

Sarah Large

Weather Conditions

Date	Conditions
Saturday 24 June 2023	Dry, warm, 26-27°C, 90% cloud, WSW breeze up to 3-4 m/s.
Friday 07 July 2023	Dry, warm, ~26°C, 20% cloud, SSE breeze 3-4 m/s with gusts up to 5-6 m/s.
Tuesday 15 August 2023	Dry, warm, 20-23°C, 10% cloud, W breeze with gusts up to 3-4m/s.

Instrumentation used

Serial Number	Date
Norsonic 140 Sound Level Meter (1403138) Norsonic 1251 Calibrator (31991)	Saturday 24 June 2023
	Friday 07 July 2023
Norsonic 140 Sound Level Meter (1402998) Norsonic 1251 Calibrator (32466)	Tuesday 15 August 2023

Calibration

The sensitivity of the meter was verified on site immediately before and after the surveys. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
12:35-15:10, Saturday 24 June 2023	113.6 dB(A)	113.6 dB(A)
14:50-17:55, Friday 07 July 2023	113.6 dB(A)	113.4 dB(A)
10:25-13:00, Tuesday 15 August 2023	113.8 dB(A)	113.6 dB(A)

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

Appendix D (continued)

Survey Details

Attended sample measurements of 15 minute duration were taken at four locations. The microphone of the meter, positioned on a tripod, was at a height of between 1.2 and 1.5 metres above local ground level away from reflecting surfaces other than the ground, with a windshield used throughout.

The first survey on Saturday 24 June 2023 was arranged such that monitoring could be undertaken before and after the processing plant on site had stopped operating. However, the processing plant and site shut down early and all sample measurements were undertaken without the site operating. It is also noted that as a result, the majority of the survey period coincides with times of the day that the site is not proposing to operate.

The second survey on Friday 07 July 2023 was arranged such that the measurements could be undertaken before and after the processing plant (and majority of site operations) had stopped operating. It was arranged with the site that operations would stop earlier than normal at 5pm.

The findings of the July survey indicated that the background sound levels at the sample monitoring locations were not influenced by operations on site and as such the August survey was undertaken with normal operations taking place on site.

Appendix E – Sample Survey Results

Saturday 24 June 2023, 12:35-15:10

Location	Start Time	Results dB (T = 15 minutes)				Comments / Observations
		$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A10,T}$	$L_{A90,T}$	
A. Tuddenham House	12:35	46	73	40	30	Distant road traffic noise, distant aircraft, birdsong, crickets. Bucket rattle and tonal reverse alarm audible (not from site). Distant voices. Local road traffic. Wind 1-2m/s.
B. Mill Farm House	12:56	43	65	43	33	Distant and local road traffic noise, distant aircraft, birdsong, whine from Heygates Mill. Light aircraft, crickets. Wind 2m/s.
C. Heygates Mill	13:16	61	83	63	48	Local and distant road traffic noise, birdsong, constant broadband noise from Heygates Mill (dictates background sound level). No wind, still.
D. West Street	13:34	52	75	48	34	Distant aircraft, distant road traffic noise, birdsong, crickets, sheep. People playing music loudly and walking past. No wind, still.
A. Tuddenham House	13:56	50	73	41	29	Birdsong, crickets, birdscarers, dog barking briefly, local road traffic. Possibly some distant road traffic at border of audibility. Wind 2-3m/s.
B. Mill Farm House	14:16	42	63	43	34	Whine from Heygates Mill, distant dog barks, birdsong, crickets, local road traffic noise, distant jet aircraft. Wind 2-3m/s.
C. Heygates Mill	14:34	60	79	63	48	Local road traffic noise, broadband noise from Heygates Mill, chickens at nearby dwelling, birdsong. No wind, still.
D. West Street	14:51	46	64	49	35	Distant road traffic noise, distant aircraft, sheep, birdsong, crickets, distant voices. No wind, still. (Battery failure so measurement shortened).

Appendix E (continued)

Friday 07 July 2023, 14:50-17:55

Location	Start Time	Results dB (T = 15 minutes)				Comments / Observations
		$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A10,T}$	$L_{A90,T}$	
A. Tuddenham House	14:51	54	82	46	42	Distant road traffic noise, breeze in trees / grass. Crickets. Rumble of military aircraft in distance. Local road traffic noise. Site not audible. Wind: 3-4m/s.
B'. Mill Farm House	15:12	53	77	51	42	Breeze in trees / grass. Local road traffic noise. Intermittent DIY noise at gate at entrance to dwelling. Distant road traffic noise. Mill / factory whine just audible. Distant aircraft. Site not audible. Wind: 3-5m/s.
C. Heygates Mill	15:33	62	77	66	50	Local road traffic noise, constant plant noise from mill. Site not audible. Wind: 0.5m/s (sheltered location)
D. West Street	15:50	57	83	47	43	Constant broadband plant noise from mill. Breeze in trees / grass. Sheep. Local road traffic noise. Voices at nearby dwelling. Distant aircraft. Site not audible. Wind: 1-2m/s.
A. Tuddenham House	16:14	52	75	48	42	Local and distant road traffic noise. Breeze in trees / grass. Birdsong. Distant voices. Site not audible. Wind: 4m/s.
B'. Mill Farm House	16:42	48	71	49	40	Distant road traffic noise. Wind in trees / grass. Intermittent DIY noise at gate to dwelling. Whine from mill at border of audibility. Site not audible. Wind: 2-4m/s, gusts up to 5m/s.
B'. Mill Farm House	16:57	54	82	52	40	[Processing plant at site stopped operation] Local and distant road traffic noise. Whine just audible from direction of mill. Wind in trees / grass. Crickets. (Site not audible). Wind: 3-4m/s, gusts up to 6m/s.
D. West Street	17:16	46	67	46	42	[Processing plant at site stopped operation]. Constant plant noise from mill. Distant road traffic noise at border of audibility. Sheep. Breeze in trees / grass. Dog barking intermittently. Local road traffic noise. (Site not audible). Wind: 2-3m/s.
A. Tuddenham House	17:38	52	77	50	39	[Processing plant at site stopped operation] Local and distant road traffic noise. Breeze in trees / grass. Birdsong. Distant aircraft. (Site not audible). Wind: 3-5m/s.

Appendix E (continued)

Tuesday 15 August 2023, 10:25-13:00

Location	Start Time	Results dB (T = 15 minutes)				Comments / Observations
		$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A10,T}$	$L_{A90,T}$	
A. Tuddenham House	10:28	48	69	49	39*	Breeze in trees / grass, local road traffic noise, insects, harvesting in adjacent field - tractor noise at variable levels. Distant road traffic noise. Gusts up to 3m/s, wind generally less. Use L_{A99} as estimate of background sound level due to tractor noise. Site not audible.
B'. Mill Farm House	10:48	50	73	45	38	Whine and broadband plant noise from Heygates Mill. Distant tractor engine noise, distant road traffic noise, insects. Military jet noise. Site not audible. Less wind here, 2m/s.
C. Heygates Mill	11:08	62	83	66	50	Constant broadband plant noise from Heygates Mill. Local road traffic noise, military aircraft, light aircraft. Site not audible. No wind, still.
D. West Street	11:26	45	72	47	38	Distant road traffic noise, breeze in trees / grass, insects, birdsong, voices at nearby dwellings, sheep, military aircraft. Site not audible. Gentle breeze, 2-3m/s.
D. West Street	11:43	43	58	46	38	Insects, birdsong, distant road traffic noise, sheep, military aircraft. Site not audible. Less wind, around 2m/s.
C. Heygates Mill	12:03	62	79	66	50	Road traffic noise, plant noise from Heygates Mill, Site not audible. Still, no wind.
B'. Mill Farm House	12:23	43	61	45	39	Broadband noise and whine from Heygates Mill. Distant road traffic noise, insects, breeze in trees. Site not audible apart from 2 occasions, 1-2 seconds of white noise reverse alarms. Gentle breeze, 2-3m/s.
A. Tuddenham House	12:43	48	76	44	39	Insects, distant grass cutting at dwelling, birdsong, local road traffic, distant aircraft. Tractors no longer in adjacent field. Gentle breeze 2-3m/s. Site not audible.

* The value presented is the L_{A99}. The L_{A90} was influenced by noise from a nearby tractor and as such the L_{A99} value has been used instead to represent the background sound level for this period. The L_{A90} was 41dB.

Appendix F – Installed Sound Level Meter Survey Details

Dates and Location of Installed Meter

Friday 24 June 2023 to Friday 07 July 2023

Location – On Site (see Appendix C).

Meter Installed and Collected by:

Sarah Large

Weather Conditions

A summary of the results from the weather station are tabulated below.

Day	Date	Dominant Wind Direction	Wind speed m/s			Temp degrees C			Rain
			Min	Max	Average	Min	Max	Average	
Saturday	24/06/2023	SW	0.0	4.5	3.3	16	27	22	No
Sunday	25/06/2023	S	1.3	9.8	5.7	17	31	24	No
Monday	26/06/2023	W	0.9	7.6	5.2	12	23	18	No
Tuesday	27/06/2023	WSW	0.9	5.8	3.4	12	21	17	No
Wednesday	28/06/2023	WSW	1.3	5.4	3.7	18	23	21	No
Thursday	29/06/2023	NNW	0.0	5.4	3.5	14	22	18	Yes
Friday	30/06/2023	SW	0.0	7.6	4.0	9	19	16	Yes
Saturday	01/07/2023	WNW	3.1	8.0	5.7	14	21	18	Yes
Sunday	02/07/2023	W	2.7	9.4	5.7	11	19	15	No
Monday	03/07/2023	WSW	2.7	10.7	6.4	10	19	15	No
Tuesday	04/07/2023	WSW	1.3	7.2	4.0	12	17	14	Yes
Wednesday	05/07/2023	W	2.7	8.9	5.4	11	20	15	Yes
Thursday	06/07/2023	SSW	2.7	6.3	4.2	10	22	16	No
Friday	07/07/2023	SSE	1.3	7.2	4.4	12	28	21	No

Some of the weather data are presented graphically in Appendix G. The full results are available on request.

Instrumentation used (Serial Number)

Instrumentation used:

RION NL-52 Sound Level Meter (420715)

RION NC-74 Calibrator (34425556)

Appendix F (continued)

Calibration

The sensitivity of the meter was verified on site immediately before and after the install. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
11:50 on Friday 24 June 2023 to 18:06 on Friday 07 July 2023	93.9 dB(A)	93.8 dB(A)

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

Survey Details

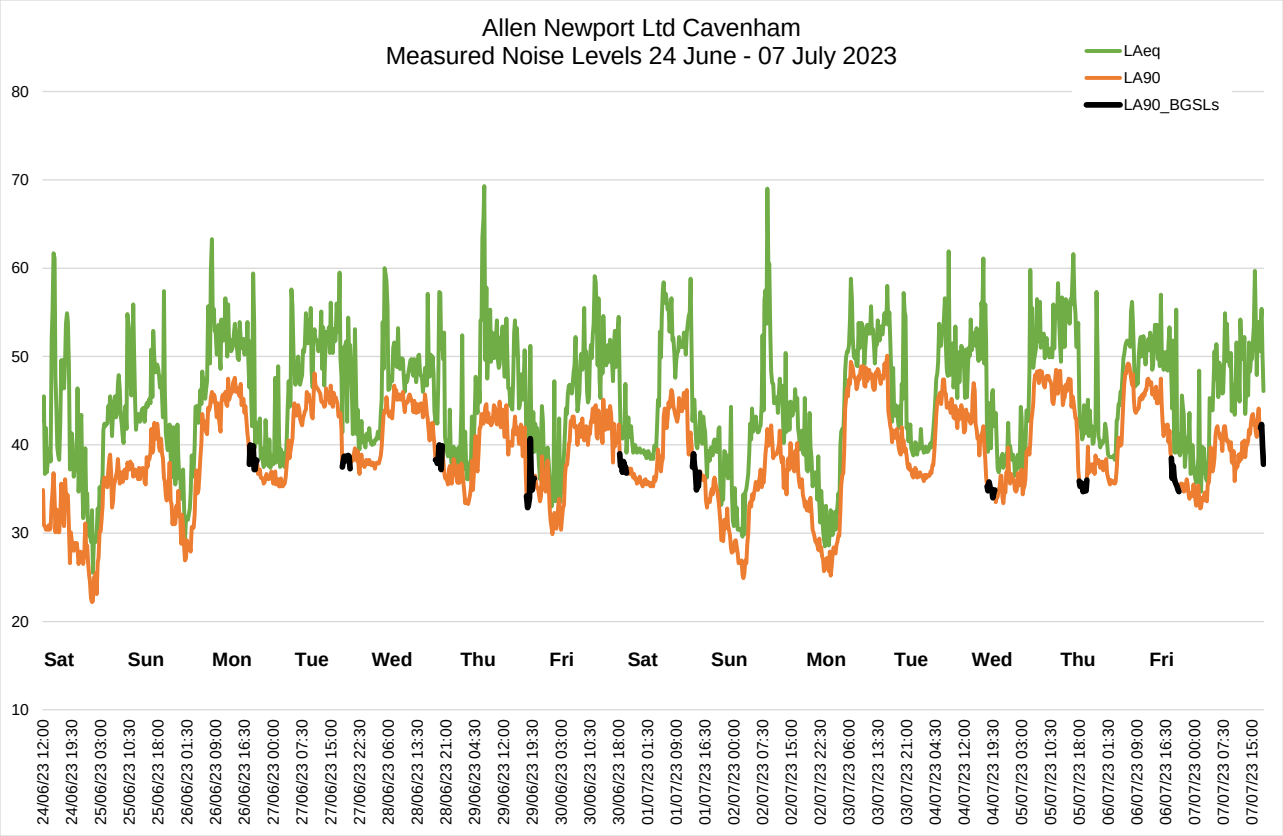
Continuous measurements of 15 minute duration were taken at the chosen location over the specified period. The microphone was fitted with a RION WS-15 windshield which was used throughout the measurements.

The results from the installed sound level meter are presented in chart form in Appendix G. The data can be provided in spreadsheet/tabular form on request.

Periods used to determine typical background sound levels outside of the site's operating hours are highlighted in bold on the chart in Appendix G.

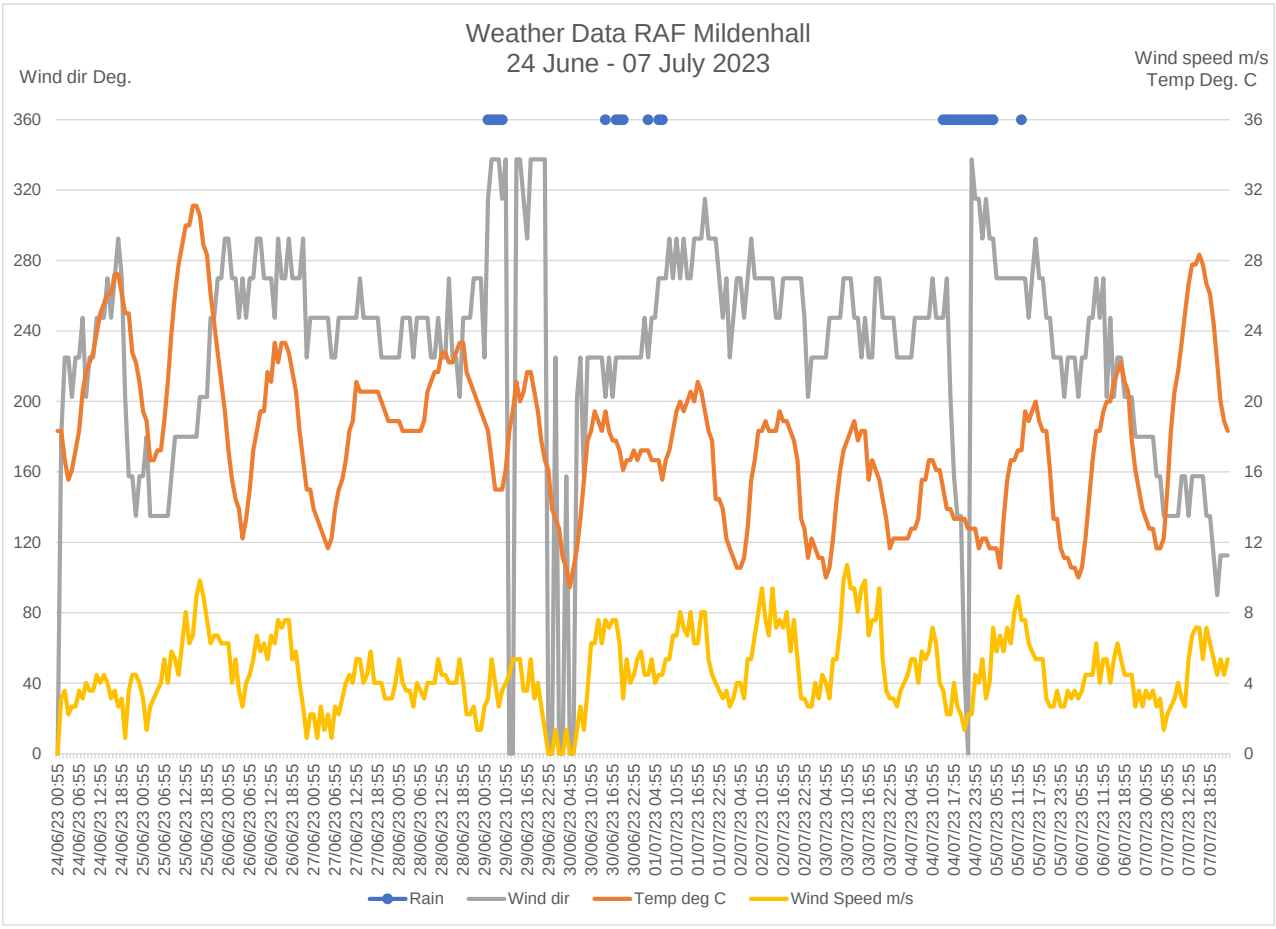
Appendix G – Installed Sound Level Meter Data and Weather Data

Install Data – Saturday 24 June to Friday 07 July 2023:



Appendix G (continued)

Weather Data - Saturday 24 June to Friday 07 July 2023:



Appendix H – Plant Noise Survey Details & Results

Dates and Location of Survey

Tuesday 22 May 2018

Survey carried out by:

Dr Robert Storey

Weather Conditions

Dry, light cloud, 22-23^{o}C, N/Ne breeze 0-4 m/s

Instrumentation used (Serial Number)

Instrumentation used:

Norsonic 140 Sound Level Meter (1404819)
Norsonic 1251 Calibrator (33321)

Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
14:25 to 14:50 on Tuesday 22 May 2018	113.7 dB(A)	113.5 dB(A)

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 certificate of calibration. In addition, the meter and calibrator undergo traceable calibration at an external laboratory every two years.

Survey Details

Continuous measurements of 1 minute duration were taken at locations around the plant. The microphone was fitted with a windshield which was used throughout the measurements.

The results from the are presented below.

Description of Activity	Distance from Dominant Source (m)	Noise Level dB $L_{Aeq,T}$	Noise Level dB $L_{A90,T}$
End of conveyors	14	66/66	65/65
Side of plant	14	73/72	72/72
Side of plant	14	65/65	65/64
Conveyor motor area	5	73/73	72/72
Wash plant end	7	77/77	76/76
By Evowash 102	3	74/74	73/73
Wash plant side	4	77/77	76/76
Side of plant	14	65/65	64/64

Appendix H (continued)

Dates and Location of Survey

Thursday 21 May 2020

Location – Cavenham Quarry

Survey carried out by:

Dr Paul Cockcroft

Weather Conditions

Dry, sunny, partly clouds, ~22^{o}C, SW breeze ~1 m/s

Instrumentation used (Serial Number)

Instrumentation used:

Norsonic 140 Sound Level Meter (1403136)
Norsonic 1251 Calibrator (31992)

Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
12:30 to 12:55 on Thursday 21 May 2020	113.9 dB(A)	113.8 dB(A)

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 certificate of calibration. In addition, the meter and calibrator undergo traceable calibration at an external laboratory every two years.

Survey Details

Continuous measurements of up to 5 minute duration were taken at locations around the plant. The microphone was fitted with a windshield which was used throughout the measurements.

The results from the are presented below.

Description of Activity	Distance from Dominant Source (m)	Noise Level dB $L_{Aeq,T}$	Noise Level dB $L_{A90,T}$
Plant side (towards weighbridge)	100	58	57
Plant side (to N)	40	67	66
Plant side (to NE)	50	65	64

Appendix I – SoundPLAN Noise Mapping Assumptions

Calculations were undertaken using SoundPLAN 8.2 (updated 20 June 2023)

Noise calculations were made 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 90% soft ground across the calculation area.

Barrier attenuation is included in the calculations due to that afforded by the existing topography in the vicinity of the site (including the bunding in place on the eastern side).

Sound Power Level data has been included based on plant noise measurements obtained on site on 21 May 2020 as well as measurements of the same type of plant as that proposed on another site obtained on 22 May 2018 plus data contained within the WBM plant noise database of previous measurements of other similar plant items to those to be on site.

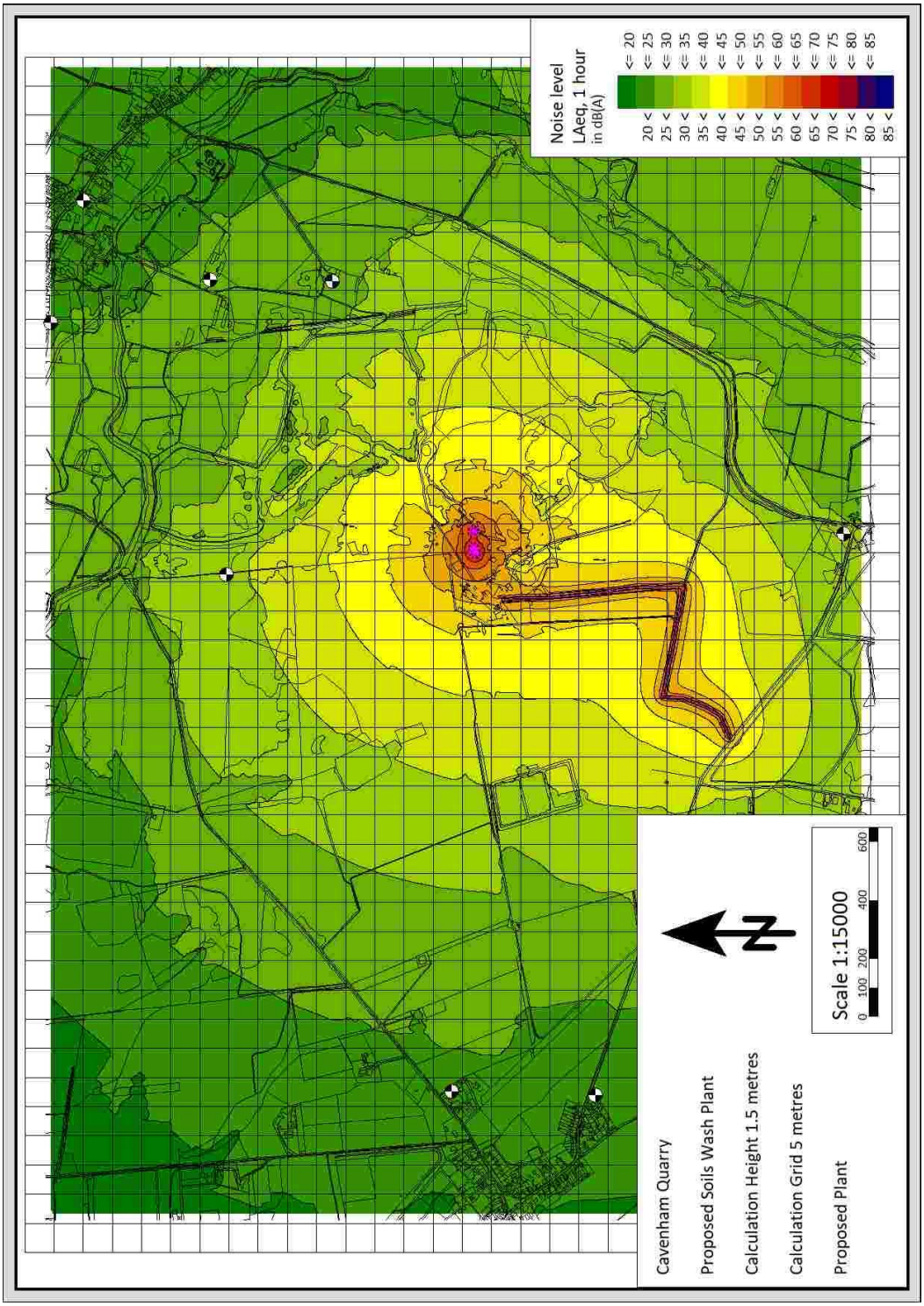
A summary of the data input into the SoundPLAN calculations is presented in the following table.

Plant Item	Sound Power Level dB L_{WA}	Source Height (m)	On time	OS Grid Reference
Soils Wash Plant				
Soils wash plant	106	5	100%	E: 585899 N: 271657
Loading Shovel	106	2	50%	E: 575918 N: 271663
Minerals Wash Plant				
Minerals wash plant	107	5	100%	E: 575817 N: 271597
Loading Shovel	106	2	100%	E: 575827 N: 271576
Recycling Plant				
Crusher	110	4	100%	E: 575941 N: 271681
Screens	113	4	100%	E: 575955 N: 271698
Excavator	104	3	100%	E: 575932 N: 271681
Loading Shovel at Stockpiles	106	2	50%	E: 575974 N: 271659
Infilling Operations				
Tipping of Material	110	0.5	10%	E: 576615 N: 272063
Dozer	108	2	100%	E: 576604 N: 272107
Dump Trucks	105 (15 kph)	2	6 per hour	N/A
HGV Movements				
HGVs within site	104 (16 kph)	2	12 per hour	N/A

Note: Permitted mineral extraction on the site is complete and has therefore not been included in the calculations. Future extraction (dependent on obtaining planning permission) would be to the west of the main site and would be significantly further away from the receptors considered than current infilling operations.

Appendix J – SoundPLAN Noise Plots

Soils Wash Plant and Associated Operations (07:00-18:00):



Appendix J (continued)

All Site Operations (07:00-18:00):