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DUNTON ENVIRONMENTAL, SMETHWICK NOISE IMPACT ASSESSMENT

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SUMMARY

This noise assessment has been prepared on behalf of Dunton Environmental Ltd in support of a Permitting Application for a new ground remediation and waste processing facility located on Bridge Street North, Smethwick, Birmingham. The facility will operate during the daytime only. The nearest residential properties are around 90m away.

Noise emissions from the facility have been calculated using proprietary modelling software and measurements of the existing plant and processes at the facility in Wolverhampton. The impact of proposed operations has been assessed in accordance with BS4142:2014+ A1 2019 and compared to background noise levels measured at the nearest properties.

Noise levels from the facility may exceed background levels by around 5dB at the frontage of the nearest dwellings but given the context of the area industrial sound from the proposed development is not expected to result in any significant effects. Noise levels in external amenity areas associated with these dwellings are expected to be lower.

Residual adverse effects will be minimised through implementation of BPM and mitigation measures described in this report.

1. INTRODUCTION

This noise assessment has been prepared by Ramboll UK Limited ('Ramboll') on behalf of Dunton Environmental Ltd (the 'Client') in support of a Permitting Application for a new ground remediation and waste processing facility (the 'site') located on Bridge Street North, Smethwick, Birmingham.

The impact of noise from operation of the proposed facility has been assessed. An assessment of ground borne vibration is not considered necessary due to the large distance to the nearest properties and the nature of the processes on site which are not expected to typically generate high levels of vibration.

This report is prepared in support of the permitting application for the scheme. It is not intended to represent a full acoustic design of the proposed facility.

1.1 Location

The proposed facility will occupy the site of a former commercial/industrial premises adjacent to the canal at Bridge Street North, Smethwick. The location of the site is shown in Figure 1.

Vehicular access to the site will be from the east via Bridge Street North.



Figure 1 – Approximate red line boundary and site location

1.2 Existing and Proposed Facility

Dunton Environmental process soil and waste building materials brought in from off-site by lorry, sorted and processed, then removed from site for distribution by lorry.

A visit was made to the existing Dunton facility in Wolverhampton. Measurements of noise were made from this facility. The new facility will operate in the same way with similar plant and processes. The basic steps of the process at the facility during normal operation are:

- Delivery of materials (typically by 32t tipper)
- Moving of material on site by wheeled loader/tracked excavator
- Tipping material into a hopper and movement by conveyor to an enclosed hand-picking station (for asbestos removal etc).
- Loading material by wheeled loader/excavator into tippers for delivery
- HGV movements and wheel wash

Noise from equipment and processes at the existing Wolverhampton facility has been measured and used in the assessment to predict noise from the new facility. Details are given in Section 4.

Much of the processing of materials will take place inside the main warehouse building at Smethwick (see Figure 2) which will repurpose the current building on the site. This includes unloading of lorries and moving material by wheeled loader as well as loading the hopper and conveyor which would take material to the separate hand-picking building.

Core hours will be 07:30 to 17:00 Monday to Friday with main processes usually occurring between 08:00 – 16:30.

On Saturdays the site may be in use but normally just for maintenance and not for routine operations. Saturday hours would be 07:30 to 13:30. No Sunday working is proposed.

1.3 Non-typical operation

In addition, there may be occasional use of other machinery on the site for short periods which are not part of the primary operation of the site. This includes use of a hired mobile crusher for crushing oversized pieces. This would be used at the western end of the site where oversized materials are stored. This may be required perhaps every 2 months or so and run for 2/3 hours per day. It is more likely to be required in winter when demand for the specific type of processed material is higher.

There may also be occasional use of a mobile screen but similarly this is not part of the primary operation of the site and would be occasional use only. A screen could be located within the building on site if required. It is likely to be lower in noise than use of a crusher.

1.4 Site layout

The general layout of the Dunton Smethwick site is shown in Figure 2.

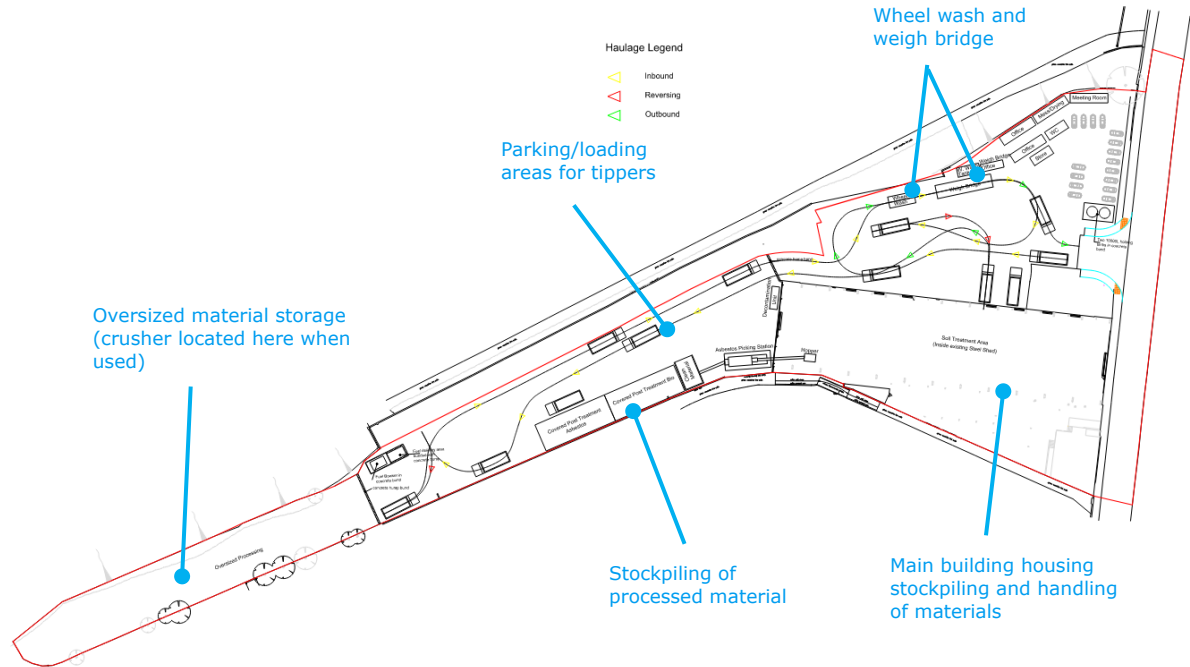


Figure 2 – General layout of proposed facility

1.5 Receptor Locations

The noise sensitive receptors considered in this assessment are summarised below. And shown in Figure 3.

Location	Description	Approx. distance from site boundary at closest point
R1	Houses on Evered Close, Surrey Close, Hidden Lock, Whitehouse Drive etc.	90m
R2	Houses on Bridge Street South	125m

Table 1 – Nearest noise sensitive receptors

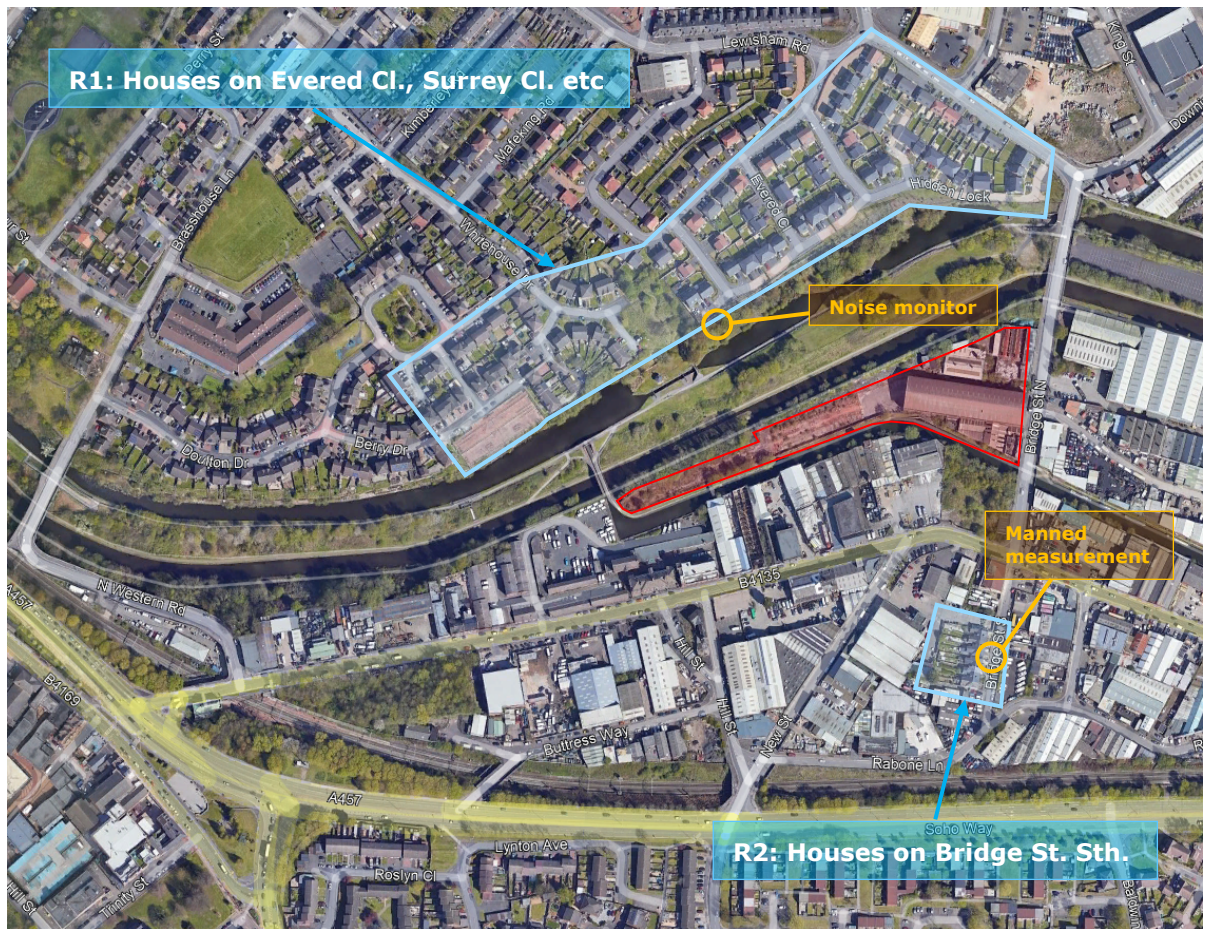


Figure 3 – Nearest noise sensitive receptors & background noise measurement positions

2. BACKGROUND NOISE

2.1 Noise Monitor

An unattended noise monitor was installed close to the houses to the north of the site at the position shown in Figure 3. The monitor ran continuously between Thursday 1st and Monday 5th September 2022.

The noise monitor was chosen to represent the background noise level at the houses located on Evered Close, Surrey Close, Hidden Lock, Whitehouse Drive etc.

The microphone was located in free-field conditions at a height of 1.5m. Noise levels were monitored continuously over the survey period in 5-minute intervals.

2.2 Manned Measurements

Attended measurements were made at the houses on Bridge Street South at the position shown in Figure 3. Measurements were made on Monday 5 September 2022 around 13:30.

2.3 Measurement Results

The unattended survey results are shown on the graph in Figure 4. Full tabulated results are available on request.

Typical background noise levels have been determined from the measured levels and are summarised in Table 2. These have been used to represent typical background noise levels at these positions for the assessment.

Position	Typical Noise Level (ref. Figure 4)
	Day (07:00 – 23:00)
Noise Monitor	50 dB $L_{Aeq,1hr}^1$
	47 dB $L_{A90,1hr}^1$
Manned measurement Bridge St Sth	57 dB $L_{Aeq,15mins}^2$
	53 dB $L_{A90,15mins}^2$

¹ estimated from average of consecutive 5min measurements within each hour made by the monitor

² representative of the 1 hour L_{Aeq} at this position

Table 2 – Typical background noise levels

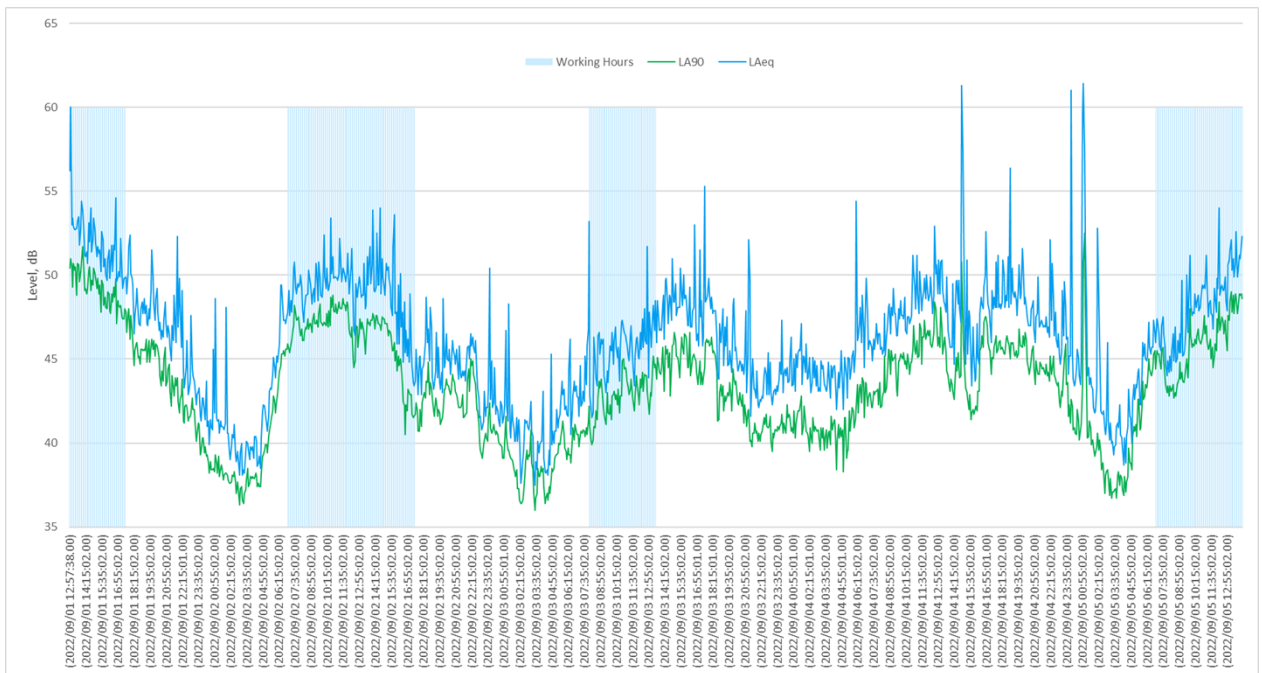


Figure 4 – Noise levels measured at Noise Monitor Position. Site operating hours highlighted in blue

2.4 Observations

It was noted that background noise affecting the area around the nearest houses at the noise monitor location included noise from traffic on Bridge Street North, as well as roads further away (for example the A457 to the south). Industrial noise from the surrounding industrial areas was also audible. Noise from plant (possibly forklifts etc) and loading/unloading of HGVs or buildings at other sites was noted. The general noise environment in the area was considered industrial in nature, which is expected given the large amount of industrial development in the immediate area surrounding the site.

3. NOISE CRITERIA

3.1 Sandwell Metropolitan Borough Council

No specific guidance on acceptable industrial noise levels is given in SMBC planning guidance. Attention is given to paragraph 7.14 of the Smethwick Area Action Plan which advises that:

"Employment sites should be identified where easy access to the strategic highway network can be achieved and where their presence will not adversely affect existing residential areas through noise, disturbance or traffic congestion".

The procedures in British Standard 4142:2014 are considered appropriate to assess any adverse effects on residential areas in relation to noise from industrial sites.

3.2 BS 4142: 2014 + A1 2019 Method for rating and assessing industrial and commercial sound

British Standard 4142:2014¹ provides a method for rating industrial and commercial sound and assessing resulting impacts upon people. The method is applicable to fixed plant installations, sound from industrial and manufacturing process and other associated activities.

The basis of BS4142 is a comparison between the background noise level in the vicinity of residential locations and the rating level of the noise source under consideration. The relevant parameters in this instance are as follows:

- i. Background Level, $L_{A90,T}$: defined in the Standard as the 'A' weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, and quoted to the nearest whole number of decibels;
- ii. Specific Level, $L_{Aeq,T}$: the equivalent continuous 'A' weighted sound pressure level at the assessment location in the absence of the specific sound source under consideration, over a given time interval, T; and
- iii. Rating Level, $L_{Ar,T}$: the specific sound level plus any adjustment made for the characteristic features of the noise.

Potential impacts are predicted from the difference between the representative background level at a noise sensitive receptor and the rating level from the noise source considered. The standard suggests that the greater the difference, the greater the magnitude of impact.

Section 11 of BS 4142 gives guidance for significance of impacts in reference to comparing rating noise levels against existing background noise levels:

- i. Typically, the greater this difference, the greater the magnitude of the impact;
- ii. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- iii. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and

¹ British Standards Institute, 2014. British Standard BS 4142:2014 +A1:2019 Methods for rating and assessing industrial and commercial sound. BSI.

- iv. 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.

In determining the significance of the impact, BS 4142 requires a consideration of the context of the assessment i.e. the nature of the existing acoustic environment and the new noise source, and the sensitivity of the affected receptors.

Noise Characteristics and Penalties

BS4142 applies different penalties for noise sources that have an acoustic feature. These penalties are applied to the plant noise level where such features increase attention to the noise, such as tonality and intermittent operation.

BS 4142 gives a guide to the level of penalty that should be applied using the subjective method. This is summarised below.

Tonality

- *Tone just perceptible at the receptor: +2dB*
- *Tone clearly perceptible at the receptor: +4dB*
- *Tone highly perceptible at the receptor: +6dB*

Impulsivity

- *Sound that is highly impulsive just perceptible at the noise receptor: +3dB*
- *Sound that is highly impulsive clearly perceptible at the receptor: +6dB*
- *Sound that is highly impulsive highly perceptible at the receptor: +9dB*

Intermittency

- *Identifiable on/off conditions, readily distinctive against the residual acoustic environment: +3dB*

3.3 Planning Practice Guidance

Planning Practice Guidance² (PPG) is a web-based resource, which includes a section on noise. This resource provides guidance on how to determine the noise impact in terms of whether a significant adverse effect is likely to occur and/or whether a good standard of amenity can be achieved.

In line with the Noise Policy Statement for England, Planning Practice Guidance introduces the following concepts:

- i. Significant observed adverse effect level (SOAEL): This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- ii. Lowest observed adverse effect level (LOAEL): this is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
- iii. No observed effect level (NOEL): this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

² GOV.UK. 2019. Noise. Available at: <https://www.gov.uk/guidance/noise--2> [Accessed September 2021].

Table 3 summarises the noise exposure hierarchy, based on the likely average response.

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

Table 3 - Noise exposure hierarchy

In the following table we have related this to the significance of impacts described in BS 4142:2014+A1:2019 above, taking into consideration the context of the area.

Description	Typical outcome	Effect level in the context of the surrounding area
Predicted Rating Level is more than 5 dB below the prevailing Background Level at the receptor.	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response.	NOEL
Predicted Rating Level is 0 dB above the prevailing Background Level at the receptor.		NOAEL
Predicted Rating Level is 5 dB above the prevailing Background Level at the receptor.	Noise can be heard and causes small changes in behaviour, attitude or other physiological response. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	LOAEL
Predicted Rating Level is between 5 dB and 10dB above the prevailing Background Level at the receptor.	As the rating level gets higher the potential for adverse effects (material behaviour, attitude or other physiological response) increases.	
Predicted Rating Level is 10dB or more above the prevailing Background Level at the receptor.	The noise causes a material change in behaviour, attitude or other physiological response. Quality of life diminished due to change in acoustic character of the area.	SOAEL

Table 4 – Operation noise significance criteria

Given the context of the area it is considered appropriate that rating levels more than 5dB above background should be avoided where possible through suitable mitigation.

3.4 British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings

With regard to noise levels in external amenity areas, BS8233 states that:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments...”

This is in relation to noise sources without a specific character, termed “anonymous noise” (for example road traffic noise). Where the noise has a specific character, setting lower limits may be appropriate.

4. NOISE SOURCES

4.1 Measurements from Dunton Wolverhampton

As processes and equipment will be largely the same at the new site as the Wolverhampton facility, Ramboll measured samples of noise from the various activities at Wolverhampton to use in modelling noise emissions from the new site.

4.1.1 Measured Noise Levels

The processes and equipment measured, and the levels recorded are given below in Table 6. Measurements were made for the duration of the noisy activity.

Reference	Noise Source	Distance to source (m)	Duration, T mm:ss	L _{Aeq,T} dB
1	Loader loading HGV with soil/aggregate	20	01:32	73
2	HGV drive by (at site exit onto road)	3	00:19	74
3	Wheeled loader moving large rocks	10	00:31	77
4	Excavator moving soil	15	00:31	71
5	Wheeled loader loading large rocks into hopper	10	00:38	79
6	Hopper and conveyor	1	00:23	86
7	Wheel wash	4	00:11	68

Table 6 – Noise levels measured at existing Dunton Wolverhampton

4.2 Noise Modelling

Specific selections of plant items have not been finalised at this stage and example plant items have been used for the purposes of this assessment where a direct measurement from the existing facility has not been possible. The noise levels used in this assessment are considered worst case and there is opportunity to develop kit selections and schemes of attenuation further.

A summary of the noise sources included in the noise modelling exercise is given below in Table 6 and the locations of these are indicated in Figure 5.

HGVs have been given a route representative of a worst case of movements within a typical hour. This assumes a one-way system is in place.

The main building on the site will be retained. The construction of this is part brick, part metal cladding. For the purposes of the assessment the large openings in the building to allow vehicles in and out are assumed to be open all the time and these are the more significant weakness acoustically, however an area source has been used to represent sound radiating from the roof of the building, with the sound insulation of 0.7mm corrugated steel (uninsulated) applied.

Noise from within the building has been calculated by using the noise level measured from the external operating hopper/conveyor and a wheeled loader to calculate a reverberant level inside the building. Area sources have been used to represent this noise breaking out of openings in the building, through which vehicles will travel. It is assumed that any roller shutter doors are open around the building.

Modelling has been undertaken using full octave frequency spectrum data taken from measurements or datasheets for examples of similar plant, as set out in the references given.

Noise Source	Measurement/Data Used	On-time (mins per hour)	Sound Level (per item)
Inside Building			
Internal reverberant level comprising noise measured from a wheeled loader moving rocks and a hopper/conveyor	Calculated from Table 2, Ref 3 & 6	60	80 dB L _{pA} ¹
External Activity (normal operation)			
HGV movements	Table 2, Ref 2. Typical route assumed	5 per hr	99 dB L _{WA} ²
Excavator working outside	Table 2, Ref 4. Typical route assumed	15	106 dB L _{WA} ²
Wheel wash	Table 2, Ref 7	10	91 dB L _{WA} ²
External Activity (occasional use)			
Crusher	BS5228 Table C.1, ref 14 – 47t semi-mobile crusher	40	113 dB L _{WA} ²

¹ internal reverberant level

² Sound power level calculated from L_{pA} measured at a given distance

Table 7 – Noise sources used in modelling and assessment

4.2.1 Traffic generation on the surrounding roads

Access to and from the site will be via Bridge Street North to the east of the site. 20-25 HGVs per day are expected. We have assumed a worst case of 5 HGVs per hour in our calculations. Given the context of the site within a much larger industrial area, and the existing numbers of HGVs and other vehicles observed using this road during the noise survey, the small number of lorries associated with this site is not expected to result in a significant increase in noise generated on Bridge Street North.

5. CALCULATED NOISE LEVELS

5.1 Noise from site operations

A model of the proposed facility and the surrounding area was created in CadnaA software and used to calculate noise emissions from the facility experienced at the nearest sensitive properties.

5.1.1 Acoustic Penalties

Noise from the facility will be made up from a number of diverse plant sources and the cumulative noise is not expected to have any distinct tonality. It is noted however that vehicles are likely to include reverse alarms, although it is assumed that they will use white-noise type alarms to reduce impact as part of Best Practicable Means.

Plant and vehicles will be used as required through the day, and as such a penalty of **+3dB** has been applied to the cumulative noise from the site to account for intermittent use of external vehicles. BS4142 recommends this penalty where the noise has "Identifiable on/off conditions, readily distinctive against the residual acoustic environment".

5.1.2 Calculated Process and Plant Noise Levels

The level of industrial noise (the specific sound level) calculated at the nearest sensitive receptors are summarised in Table 8 below. A noise map showing noise emissions across the site and the nearby surrounding area is shown in Figure 5.

Location	Calculated specific sound level, dB $L_{Aeq,1hr}$	Acoustic penalty	Rating Level, dB $L_{Ar,1hr}$	Existing background noise level during operating hours (08:00 – 16:30), dB L_{A90}	Difference, dB
R1 Front of houses on Evered Close, Surrey Close, Hidden Lock, Whitehouse Drive etc.	48-49	+3	52	47	+5
R2 Houses on Bridge St Sth	33	+3	36	53	-17

Table 8 – Calculated noise levels from Dunton Smethwick facility

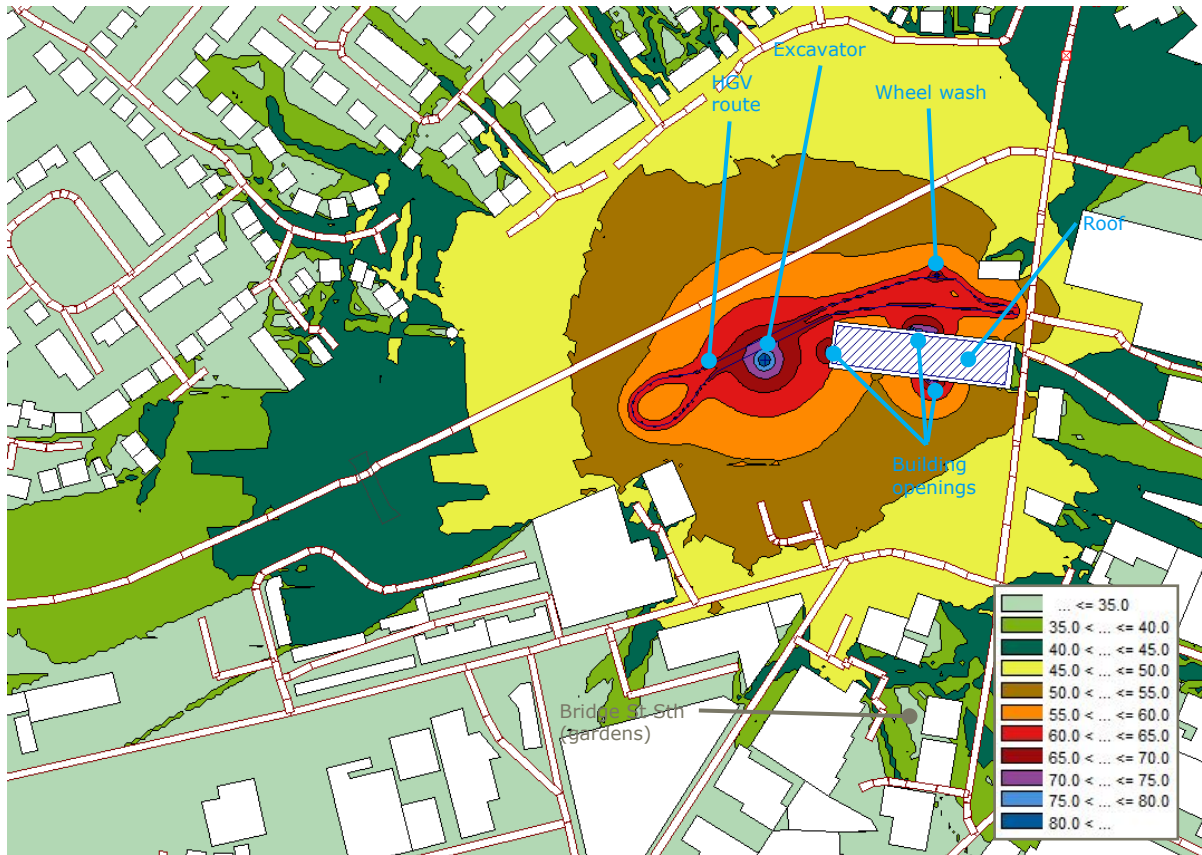


Figure 5 – Calculated specific sound levels, dB $L_{Aeq,1hr}$ at 1.5m height, daytime working hours

5.1.3 Discussion

Calculations have been made based on an estimate of typical operation within a typical hourly period.

Nearest houses

The cumulative noise rating level from the proposed facility could be up to 5dB higher than the background noise level measured outside the nearest houses to the north. It should be noted however that this is at the frontage of these houses where there are no external amenity areas. The area facing the site includes access roads and parking only.

With reference to Table 4, the projected rating level is between the LOAEL and SOAEL values for normal daytime operations.

At this level, industrial noise from the proposed development could result in small changes in behaviour, attitude or other physiological response, as the noise would be audible, however given the working hours of the site and the fact that the frontage of the houses are not used for relaxation etc, there is not expected to be any significant effects – i.e. change in the quality of life or change to the character of the area.

External amenity areas

When accounting for the site context, it is considered that industrial noise from the proposed development could have a greater impact on the external amenity areas associated with these properties. These include gardens of the houses, all of which are screened by the house itself or are further from the site.

As noted in Section 3.4, BS8233 advises that for "anonymous" sources of noise, levels in external areas should normally be limited to 50dB $L_{Aeq,T}$ where possible (and 55 dB $L_{Aeq,T}$ in noisier environments). However, in this case a lower limit would be appropriate to account for the fact that industrial noise from the site will be audible over the general background noise in the area and as such is not considered anonymous.

A upper threshold of 45dB L_{Aeq} in garden areas is considered suitable to assess the likely risk of industrial noise resulting in adverse effects on the use of the gardens. This is in comparison to the existing ambient noise levels in the area which are around 50dB $L_{Aeq,1hr}$ during the working hours of the site.

The daytime average industrial noise level from the site predicted in these gardens is 32 to 40dB $L_{Aeq,T}$ and significantly lower than the 45dB $L_{Aeq,T}$ upper threshold, and lower than the existing ambient noise level in the area that was determined during the survey.

Industrial noise levels predicted in the gardens of the houses to the south on Bridge Street South are much lower than the existing background noise level and ambient noise levels measured in this area during the survey.

On this basis, given the context of the area and the current industrial operations and traffic noise sources, industrial noise from the proposed development may be audible in gardens and amenity areas but is unlikely to result in any adverse effect on these areas (change in behaviour or quality of life to nearby residents). This is particularly the case given the limited working hours of the site - no significant noise would be generated at times when residents would be more sensitive to noise or using amenity areas, i.e. evenings and at night.

5.2 Occasional operations

Noise levels during use of temporary hired equipment such as a crusher on the site may be higher for short periods. Using noise data for a typical tracked semi-mobile crusher (47t) with a sound power of 113dB L_{WA} , the level at the frontage of the nearest houses may be up to 59dB $L_{Aeq,1hour}$, before any attenuation or mitigation (note that this is an example unit and quieter equipment may be available), and up to 12 dB above the existing daytime background noise level.

This above has the potential to result in adverse effects since the industrial noise level would be above the Significant Observed Adverse Effect Level (SOAEL) during this temporary operation. The likelihood for significant effects will be lessened through implementing of Best Practicable Means (BPM) of noise control, as discussed below, and by the fact that its use is limited in frequency and duration.

5.3 Best Practicable Means

The impact of noise from operation of the Dunton Smethwick facility should be limited by implementing Best Practicable Means for operation of the site and use of plant and equipment. This may include:

- Use of low noise plant and equipment, in particular excavators or wheeled loaders used outside of the building.
- Use of white-noise reverse alarms
- The loading/parking area for tippers is already located at a favourable position such that it provides some screening during loading operations from the HGVs themselves. While this has not been included in the modelling, it has been tested and the presence of HGVs can provide useful screening of noise.
- Careful use of plant, such as avoiding dropping materials from heights higher than necessary.
- Limiting use of metal storage containers externally to avoid noise from material being loaded into them. In practice most material is stored at ground level in piles, which is more favourable.
- Maintaining good relationships and communication with neighbours. For example informing residents of any particularly noisy activity and its duration and hours.
- For short term noisy activity such as use of a hired crusher, provide localised acoustic barriers or other screening around the activity where required. Minimise use of the equipment as far as possible and use the quietest ways of operating the machinery as possible. Use during the less sensitive parts of the day (i.e. avoid use in the earliest part of the morning working hours).
- Use stockpiled material along the north perimeter of the Oversized Material area to provide a screen to the crusher.
- Routing HGVs on main roads and avoiding routes along smaller roads closer to residential properties.

6. CONCLUSIONS

The proposed Dunton Smethwick facility is expected to produce industrial noise levels that are likely to be audible at the nearest properties. However, the likelihood of adverse effects due to industrial noise would be limited given the restricted working hours of the site and the industrial context of the surrounding area.

Industrial noise rating levels may exceed existing daytime background noise levels by up to 5dB at the frontage of the nearest houses. Given the context of the area it is considered that rating levels up to 5dB higher than background are unlikely to result in any significant effects. This is because the existing environment already includes sound of an industrial nature at the nearest receptors. Industrial noise rating levels more than 5dB above background should be avoided where possible through suitable mitigation.

Residual adverse effects due to industrial noise will be minimised through implementation of BPM and mitigation measures described in this report.

6.1 Assumptions and Limitations

All reasonable measures have been undertaken to reduce uncertainty in the baseline noise survey data and the calculations detailed in this report.

Uncertainty has been minimised by measuring noise from the actual plant used at the current facility rather than deriving from manufacturers data where possible.

Results have been rounded to the nearest A-weighted decibel.

The noise prediction model accounts for intervening topography and existing building massing. The model uses the calculation method of ISO9613-2:1996.

Noise emissions are based on benchmarking measurements from the existing facility in order to include the spectral content to account for the way different frequencies of sound propagate.

The assessments and calculations undertaken in this report are based on data and plans of the proposed development provided by the Client.

APPENDIX 1 NOISE SURVEY DETAILS

Date & time of survey

Sample measurements of activity and plant at Dunton Horsley Fields, Wolverhampton: Thursday 1st September 2022.

Noise monitor: Thursday 1st September 12:57 to Monday 5th September 14:15

Personnel

Matthew Bull (Ramboll)

Equipment

Manned measurements and noise monitor:

Sound level meter: Norsonic Nor140, serial # 1404236

Calibrator: Norsonic 1251, serial # 32190

The sound level meter was calibrated before and after the surveys with no significant drift noted.

Weather conditions

Generally clear, low wind speeds

Temperature generally 16 – 20 °C

Measured noise levels

In body of report. Full octave band data available on request