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New Horizon Plastics co Ltd
Flint

Environmental Noise Impact Assessment
P2377-REP01-REV A-BDH
11 April 2024

PROJECT: New Horizon Plastics co Ltd
Flint
Environmental Noise Impact Assessment

CLIENT: New Horizon Plastic Co Ltd
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DOCUMENT
REFERENCE: P2377-REP01-REV A-BDH

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1 EXECUTIVE SUMMARY

Sol Acoustics Ltd (“Sol”) has been appointed to provide an environmental noise impact assessment for proposed additional plant and processes to be added to the existing New Horizon Plastics Co. Ltd site that is located at Unit 27 & The Former Scrapyard, Castle Park Industrial Estate, Flint, Flintshire CH6 5XA.

Specifically, this acoustic assessment considers the proposed addition of the following new plant:

- A. A new agglomeration line to be installed on the former scrapyard site.
- B. A new “breeze bailer” to be installed on the former scrapyard site.

This acoustic assessment report considers the environmental noise impact as arising from the operation of all plant and processes associated with the intended installation (the “Facility”), including the proposed new plant, as at the nearest Noise Sensitive Receptors (“NSRs”) during the proposed hours of operation (namely 07:00 hours to 19:00 hours, 7 days per week operation).

The pre-existing environmental noise climate at the identified NSRs has been measured by Sol, between Thursday 21st March and Tuesday 26th March 2024 (inclusive).

The environmental noise emissions that shall be arising from the operation of the complete plant have been quantified, modelled, and assessed using proprietary “CadnaA” 3D noise modelling software.

It is the conclusion of this environmental noise impact assessment that the predicted total, aggregate environmental noise impact as arising from the proposed operation of the entire Facility (including all pre-existing and proposed new plant and processes cumulative), albeit assuming full compliance with the additional noise mitigation requirements as specified and presented herein, results in an “adverse” noise impact at the worst affected noise sensitive receptors, all as assessed in accordance with British Standard BS4142: 2014+A1: 2019, provided that noise mitigation measures as specified herein are wholly satisfactorily carried out in their entirety and all anticipated maximum plant noise levels as set out herein (Appendix E et al) are not exceeded in any instance, in practice.

It is the further conclusion of this environmental noise impact assessment that the predicted environmental noise impact specifically arising wholly from the operation of the proposed new plant and processes only in isolation results in a “low impact”.

Please refer to the main report and appendices for further information.

2 INTRODUCTION

Sol Acoustics Ltd (“Sol”) has been appointed to provide an environmental noise impact assessment for proposed additional plant and processes to be added to the existing New Horizon Plastics Co. Ltd site that is located at Unit 27 & The Former Scrapyard, Castle Park Industrial Estate, Flint, Flintshire CH6 5XA.

Specifically, this acoustic assessment considers the proposed addition of the following new plant:

- A. A new agglomeration line to be installed on the former scrapyard site.
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This acoustic assessment report considers the environmental noise impact as arising from the operation of all plant and processes associated with the intended installation (the “Facility”), including the proposed new plant, as at the nearest Noise Sensitive Receptors (“NSRs”) during the proposed hours of operation (namely 07:00 hours to 19:00 hours, 7 days per week operation).

Specifically, the purpose of this acoustic assessment is as follows:

- Identify the nearest pre-existing noise sensitive receptors (“NSRs”) that are most likely to be affected by environmental noise arising from plant and/or process noise that is associated with the proposed Facility.
- Determine the prevailing, pre-existing baseline background noise climate at the worst affected NSR, through direct, environmental noise measurement.
- Identify all significant noise sources associated with the Facility.
- Calculate the resultant environmental noise level contribution and impact at the nearest NSRs to the Facility, taking factors such as distance to receptors, acoustic screening, and other environmental features into consideration.
- Carry out an environmental noise assessment of the Facility in accordance with the assessment methodology that is prescribed in relevant Standards (e.g. British Standard 4142: 2014+A1: 2019) and other acoustic guidance, in order to determine the likely significance of the noise impact generated.

This acoustic report is structured as follows:

- Section 3 provides a basic description of the Facility and key surrounding NSRs.
- Section 4 provides summary details of the benchmark environmental noise survey undertaken in order to determine the pre-existing environmental noise climate at the identified NSRs.
- Section 5 provides the results of the benchmark environmental noise survey.
- Section 6 provides a summary of the pertinent acoustic Standards which has been used to assess the magnitude of the noise impact likely to be generated.
- Section 7 provides a summary of the proprietary 3D acoustic models constructed and acoustic calculations undertaken.
- Section 8 provides a BS4142: 2014+A1: 2019 acoustic assessment and preliminary Noise Management Plan.
- Section 9 provides a conclusion statement.
- *Appendix A provides a glossary of acoustic terminology.*
- *Appendix B provides details of the noise surveys undertaken and a summary of the data obtained from these.*
- *Appendix C provides a detailed site plan showing the approximate location of significant site plant and environmental noise sources.*
- *Appendix D provides details of the 3D computer noise model as constructed for this project.*
- *Appendix E provides an outline description of all key noise sources and provides indicative plant noise levels which must not be exceeded.*
- *Appendix F presents the noise data as provided by the Client.*
- *Appendix G gives details and qualifications of contributing Sol Acoustics' staff.*

3 DESCRIPTION OF SITE

3.1 General Overview and Noise Sensitive Receptors (NSRs)

The Facility is located on Unit 27 & The Former Scrapyard, Castle Park Industrial Estate, Flint, Flintshire CH6 5XA. The site is split over two sections, divided by the NCR 5 road. Immediately to the east and south are other third party industrial units and to the west and north is woodland. The nearest noise sensitive premises are as follows:

- A. Two storey housing on Aber Road, located c.230 metres to the west of the Facility.
- B. Two storey housing on Castle Dyke Street, located c.220 metres to the south east of the Facility.
- C. Two storey housing on Holywell Road, located c.240 metres to the south of the Facility.
- D. Fifteen storey apartment housing, Richard Heights, located c.340 metres to the south of the Facility.

Figure 1 indicates the location of the Facility (“Unit 27” & “the Former Scrapyard”) in relation to the identified NSRs, and also the corresponding location of the noise monitoring position used in order to inform this acoustic assessment.



Figure 1: Aerial photo overlaid with noise sensitive receptors and monitoring locations in relation to the Facility (Google 2024)

3.2 Characteristics of the Facility

The existing Facility processes LDPE waste plastic into plastic pellets, which can be used as packaging materials. The site is able to accept and process 150,000 tonnes waste per annum of plastic waste and turns it into a recycled product consisting of pellets and flakes. The recycled product is then exported outside of the UK for re-use in various industries.

A Permit Variation is required for the following plant, which is currently installed at the Facility but is not yet operational:

- C. A new agglomeration line to be installed on the former scrapyard site.
- D. A new “breeze bailer” to be installed on the former scrapyard site.

Figure 3 provides a site plan of the Facility (Unit 27 and the former scrapyard).

Figure 4 provides plan and elevation drawing of the new LD plastic agglomeration plant to be installed at the former scrapyard.

Figure 5 provides a plan and elevation drawing of the new breeze bailer plant to be installed at the former scrapyard.

3.2.2 External Building Fabric

The external building fabric to the main process building at Unit 27 comprises of a single lightweight insulated cladding panel with masonry wall at low level. The roof also comprises of a single lightweight insulated cladding panel with rooflights. There are two roller shutter doors located to the north façade and a further roller shutter door to the west. Roller shutter doors are typically left open.

3.2.3 Facility Operating Times

The Facility is permitted to operate Monday to Sunday, 07:00 to 19:00 hours, excluding Bank Holidays.

3.2.4 Facility Deliveries and Collections

Facility deliveries and collections occur during the daytime only. There could be up to a total of 8 HGV deliveries/collections to/from the former scrapyard. There are deliveries/collections to/from the Unit 27.

3.2.5 Mobile Plant

The following existing mobile plant operates within the Facility:

- Unit 27
 - 1 no. Shark shredder 440 DT (used only for loading)
 - 1 no. Molson SK140 SR excavator
 - 1 no. tractor with water tank and water pump
- Former Scrap yard
 - 1 no. Shark shredder 440 DT (used for shredding)
 - 1 no. Molson SK140 SR excavator
 - 1 no. JCB Agrisuper 542.70 loader
 - 1 no. dumper truck (9 tonne)

3.2.6 Noise Level Emissions – Existing Plant

Sol attended the existing Facility during 26 March 2024 in order to undertake sound pressure and sound intensity level measurements of the *existing plant* at the Facility during typical (worst case, full, on load) operation. All noise measurements were carried out using Type 1 Precision Grade noise monitoring equipment. The complete noise measuring systems were field calibrated immediately prior to, and following the noise survey periods.

The sound pressure level measurements comprised of full broadband A-weighted, $L_{Aeq,T}$, and third-octave unweighted, $L_{eq,T}$ sound pressure level measurements. All sound pressure level measurements were conducted over 10-second sample periods, as using an omnidirectional microphone, typically at a measurement distance of 1 metre from the target noise source in each case. In all cases, two measurements were conducted at each position in order to demonstrate repeatability of the results.

Sound pressure level measurements were conducted using an omnidirectional microphone and in broad accordance with International Standard ISO 3744:2010: '*Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane*' ("ISO3744").

Sound intensity level measurements were undertaken to provide more accurate measurements in some instances. A sound intensity probe is able to measure the sound traversing in a single direction and therefore the measured results are less affected by noise from environmental noise sources and plant or reverberant sound (including noise reflections from nearby wall surfaces).

Sound intensity level measurements were conducted using an intensity probe in broad accordance with International Standard ISO BS EN ISO 9614-2:1997: 'Acoustics. Determination of sound power levels of noise sources using sound intensity. Measurement by scanning' ("BS9614-2"). All sound intensity level measurements were conducted over 20-second sample periods, typically at a measurement distance of 200 millimetres from the target noise source in each case.

During the survey, it was not possible to undertake noise level measurements all the existing plant on site as due to restricted safe access. Noise data for this plant is currently not available from the Client. In the absence of on-site noise level data or appropriate manufacturer noise data, this assessment has assumed maximum permissible noise levels limits for the plant as based upon experience of similar plant.

- **1 no. Unit 27 process building extract fan outlet (north façade).** It was not possible to safely undertake noise level measurements of the stack outlet. (Noise level measurements of the fan motor were undertaken on site). No attenuator is currently fitted to the extract. In the absence of appropriate noise data, it is assumed that the extract fan outlet would generate a noise level of c.100dB $L_{Aeq,T}$ at one metre from stack outlet edge (and 90° off longitudinal axis of the stack). It is recommended that a duct attenuator be fitted to the discharge of the extract fan. This is discussed further in Report Section 8.2.
- **3 no. Unit 27 process building cooling towers (east façade).** Similarly, due to the size of the cooling towers, it was not possible to undertake accurate noise level readings. In the absence of appropriate noise data, it is assumed that the extract fan outlet would generate an average noise level of c.85dB $L_{Aeq,T}$ at one metre distance.

Figure 2 provides photographs of the noise sources not currently measured:

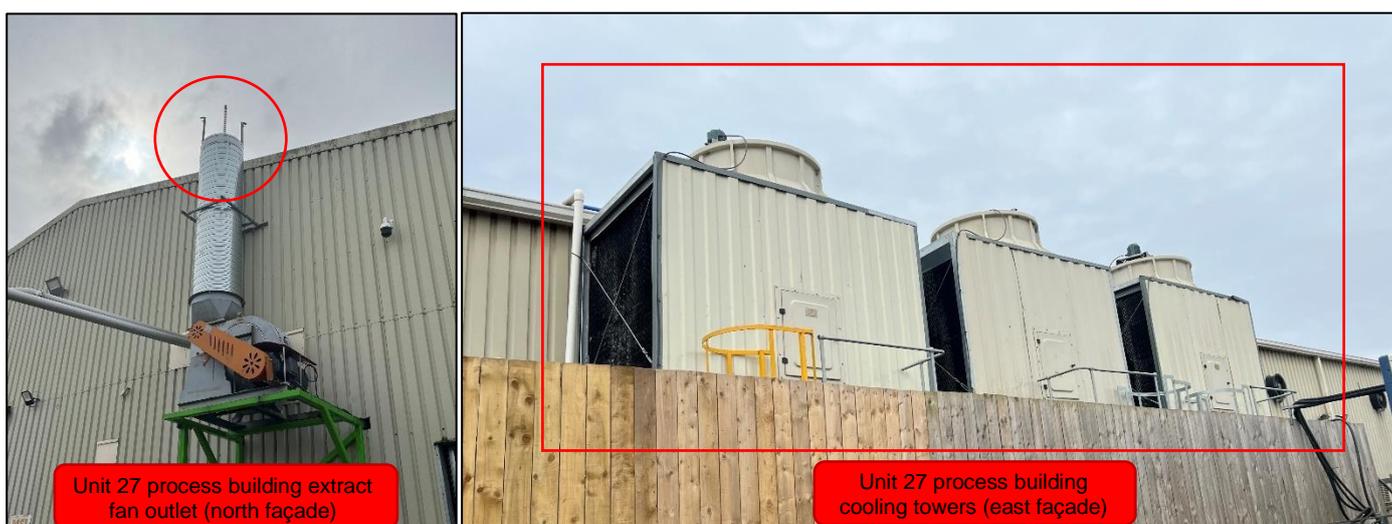


Figure 2: Photographs of existing noise sources not included within scope of site noise measurements

3.2.7 *Anticipated Noise Level Emissions – New Plant (Former Scrapyard)*

Whilst the new agglomeration line and “breeze bailer” are currently located on site, this plant is currently not operational at the time of reporting (April 2024), and it was therefore not possible to undertake noise level measurements of the plant.

Manufacturer data for the breeze bailer is currently available and is presented in Appendix F and this data states an average sound pressure level of 85dB $L_{Aeq,T}$ at 2 metres distance.

Manufacturer noise data for new agglomeration line is not available from the manufacturer. However, the plant is identical to the existing agglomeration plant as located at Unit 27 and therefore noise level data as measured from the existing plant has been used to assess the noise level impact from the proposed new plant.

It was noted during the site visit that the key noise sources as associated with the agglomeration plant are as follows:

- 2 no. dewatering machine
- 2 no. dewatering machine motor
- 2 no. agglomerator

The screw loaders, sink floating tanks, and conveyors are not deemed to be acoustically significant.

The existing centrifuge is to be replaced with a new unit. Noise data for the new centrifuge is provided in Figure F2 of Appendix F.

NEW HORIZON PLASTICS CO LTD
 ENVIRONMENTAL NOISE IMPACT ASSESSMENT
 P2377-REP01-REV A-BDH

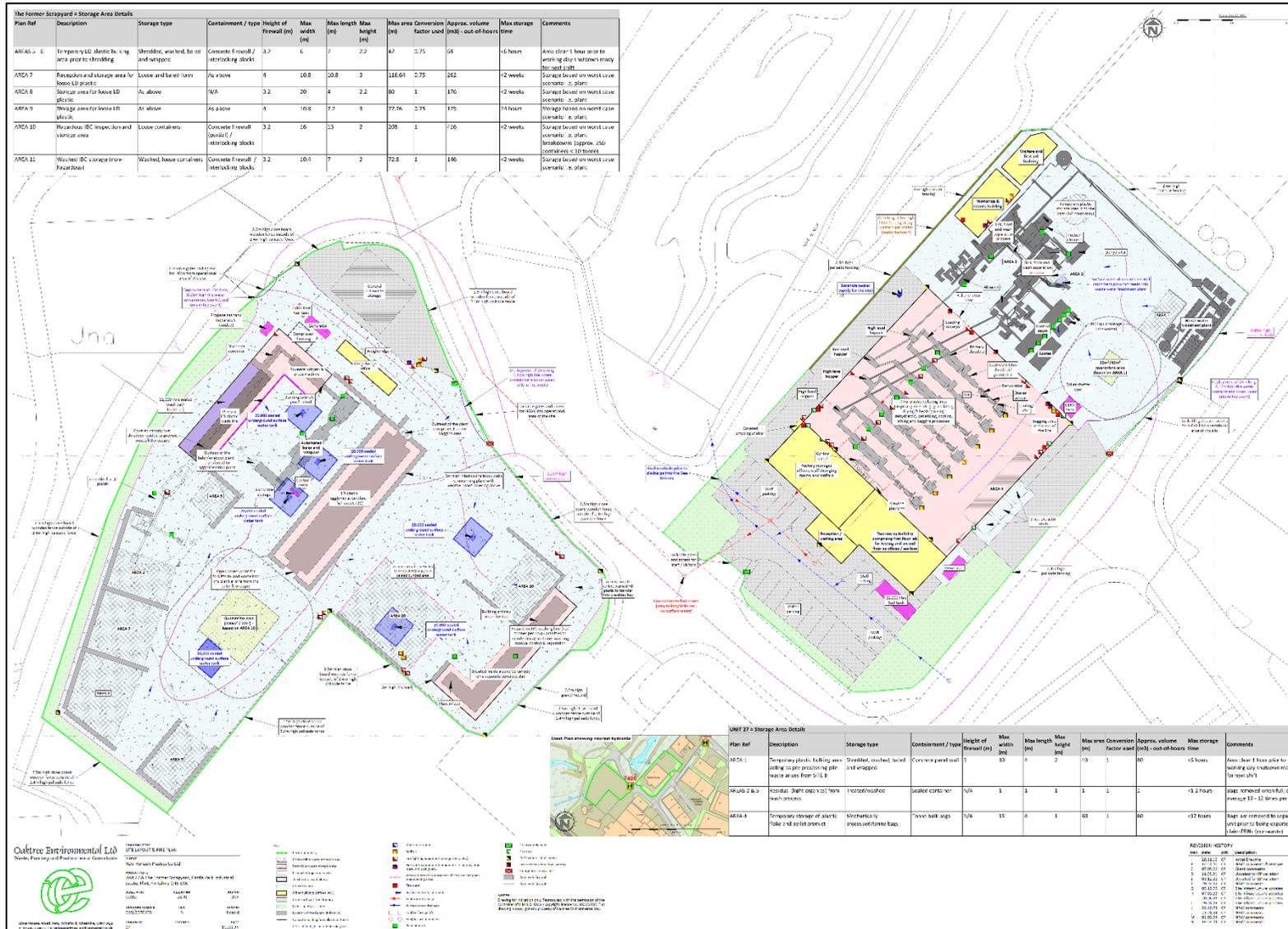


Figure 3: Proposed site plan of the Facility

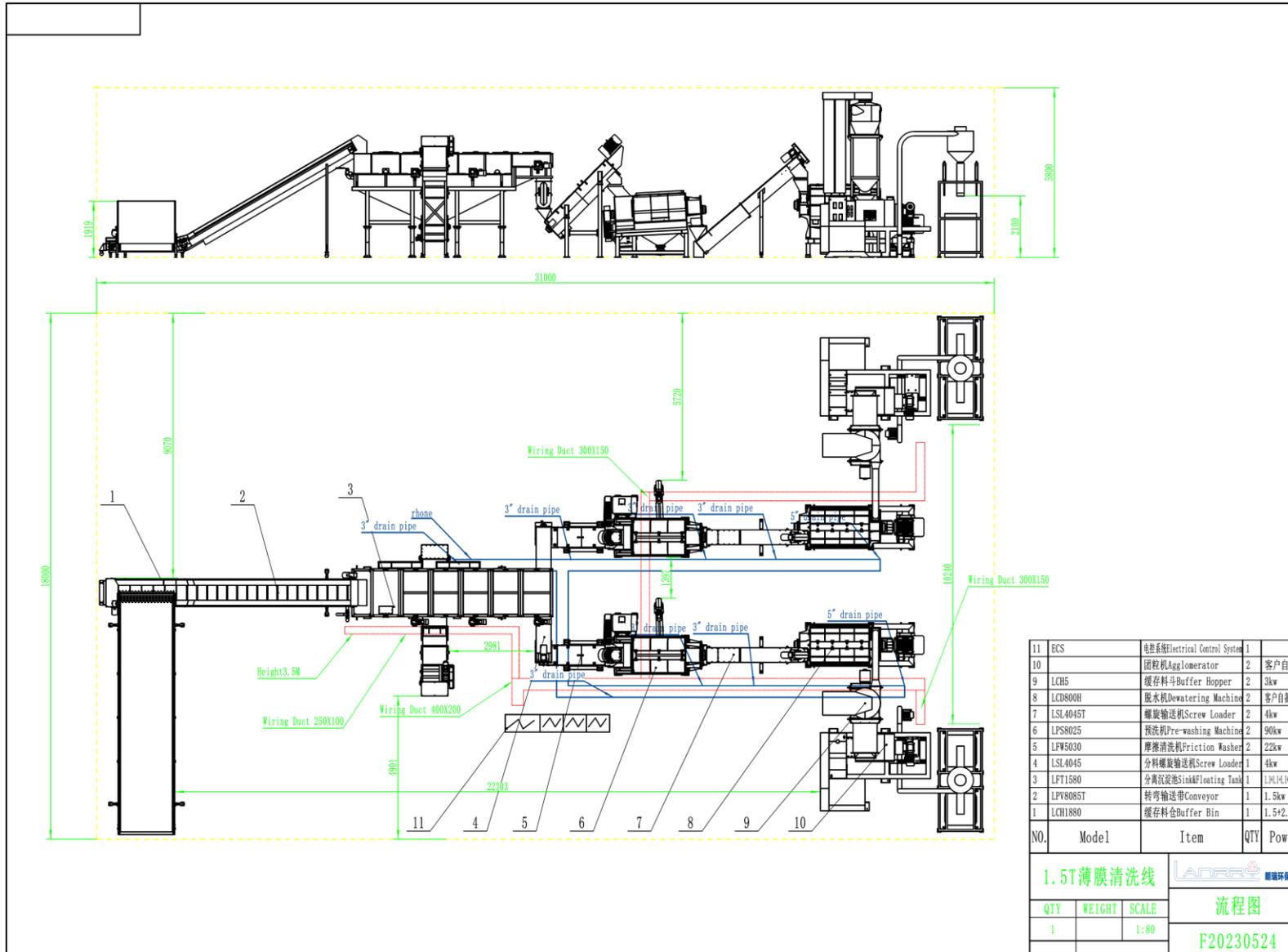


Figure 4: Plan and elevation drawing of the new LD plastic agglomeration plant to be installed at the former scrapyard

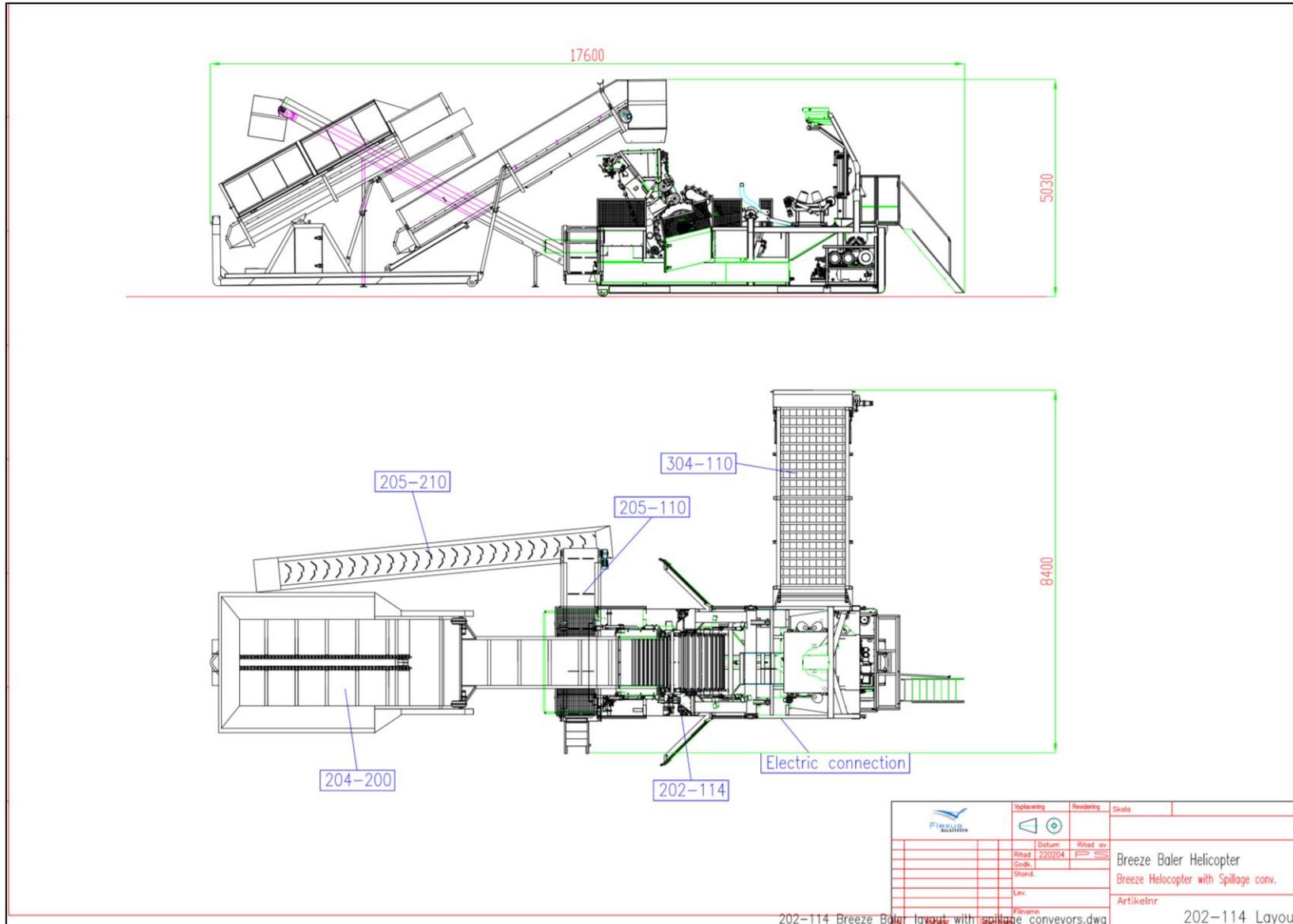


Figure 5: Plan and elevation drawing of the new breeze bailer plant to be installed at the former scrapyard

4 DETAILS OF INVESTIGATION

4.1 Pre-Existing Environmental Noise Climate

In order to inform this environmental noise benchmarking assessment, an environmental noise survey has been conducted by Sol between c.11:15 hours during Thursday 21st March and c.13:30 hours during Tuesday 26th March 2024. The purpose of the survey was to determine the prevailing pre-existing Background Sound Levels at the nearest noise sensitive premises to the Facility, as during typical weekday and weekend, daytime, evening and night time periods for environmental noise benchmarking and subsequent acoustic impact assessment purposes.

The environmental noise survey consisted of three environmental noise measurement positions, as follows:

- **Noise Monitoring Position 1:** Mast-mounted microphone at c.2 metres above local ground level and c.45 metres distance to the east of the housing off Aber Road. The microphone was mounted in “free field” acoustic conditions. Key noise sources included road traffic noise from the A548, noise from trees and intermittent noise from the nearby railway line.
- **Noise Monitoring Position 2:** Mast-mounted microphone at c.2 metres above local ground level and c.25 metres distance to the north of the housing on Castle Dyke Street. The microphone was mounted in “free-field” acoustic conditions. Key noise sources included road traffic noise from the local road network and noise from seagulls.
- **Noise Monitoring Position 3:** Mast-mounted microphone at c.3 metres above local ground level and c.30 metres distance to the northeast of the housing on Holywell Road. The microphone was mounted in “free-field” acoustic conditions. Key noise sources included road traffic noise from the local road network, noise from trees and intermittent noise from the nearby railway line. The Background Sound Levels as recorded at this position are deemed to be representative of those as expected at the housing on Holywell Road and Richard Heights.

The location of the noise monitoring positions in relation to key existing environmental noise sources is shown in Figure 1.

The full measurement results are as presented in Appendix B.

The noise survey was conducted using Type 1 Precision Grade noise monitoring equipment. The complete sound measuring systems were field calibrated immediately prior to and following the noise survey period. (Full details of all the instrumentation used are retained on file by Sol, including traceable calibration records; these are available for review if needed).

Meteorological data was recorded at Noise Monitoring Position 1 for the duration of the noise survey, as using a Professional Grade Vaisala "WXT530" weather station. Brief periods of significant rainfall, exceeding 1mmh^{-1} , occurred during the mornings of 23 March and 25 March 2024. Noise data as recorded during these periods have been omitted from the assessment; the average wind speed throughout the survey remained below 5ms^{-1} .

Notwithstanding the weather conditions recorded, the microphone system was entirely weatherproofed and fitted with all-weather environmental windshield, with bird spike also.

5 ENVIRONMENTAL NOISE SURVEY RESULTS

5.1 Pre-Existing Environmental Noise Climate

Appendix B provides fully detailed time history information for the environmental noise levels as recorded for the duration of the environmental noise survey.

Table 1 overleaf provides a basic summary of the typical overall, A-weighted noise levels measured at the various noise measurement positions, in $L_{Aeq,T}$ and $L_{A90,15min}$ terms.

The Facility was operational as during the environmental noise survey. However, Sol has been informed that the Facility did not operate during the afternoon of Saturday 23 March and the for the full day on Sunday 24 March 2024. Therefore, the Background Sound Levels as recorded during Sunday 24 March between 07:00 hours and 17:00 hours have been used to determine the typical Background Sound Levels at all measurement positions. The specific, measured noise levels pertinent to the required BS 4142: 2014+A1: 2019 environmental noise assessment are highlighted in ***bold, italic*** text:

| Measurement Position | Date | Daytime (07:00 – 19:00 Hours) | | Evening (19:00 – 23:00 Hours) | | Night time (23:00 – 07:00 Hours) | |
|----------------------|------------------------|----------------------------------|----------------------------|----------------------------------|----------------------------|-------------------------------------|----------------------------|
| | | dB LAeq,T | dB LA90,15min (Typical) | dB LAeq,T | dB LA90,15min (Typical) | dB LAeq,T | dB LA90,15min (Typical) |
| 1 | Thursday 21 March 2024 | 67* | 57 | 64 | 49 | 61 | 38 |
| | Friday 22 March 2024 | 67 | 56 | 65 | 49 | 59 | 42 |
| | Saturday 23 March 2024 | 67 | 56 | 63 | 48 | 59 | 42 |
| | Sunday 24 March 2024 | 65 | 53 | 62 | 43 | 62 | 36 |
| | Monday 25 March 2024 | 68 | 56 | 64 | 42 | 61 | 35 |
| | Tuesday 26 March 2024 | 66* | 54 | - | - | - | - |
| 2 | Thursday 21 March 2024 | 56* | 48 | 50 | 43 | 59 | 35 |
| | Friday 22 March 2024 | 58 | 50 | 50 | 43 | 56 | 40 |
| | Saturday 23 March 2024 | 56 | 52 | 53 | 46 | 58 | 42 |
| | Sunday 24 March 2024 | 56 | 45 | 45 | 34 | 52 | 33 |
| | Monday 25 March 2024 | 59 | 45 | 46 | 35 | 54 | 32 |
| | Tuesday 26 March 2024 | 57* | 44 | - | - | - | - |
| 3 | Thursday 21 March 2024 | 63* | 50 | 60 | 45 | 55 | 33 |
| | Friday 22 March 2024 | 61 | 51 | 60 | 46 | 58 | 44 |
| | Saturday 23 March 2024 | 62 | 54 | 61 | 48 | 54 | 42 |
| | Sunday 24 March 2024 | 57 | 47 | 56 | 37 | 55 | 33 |
| | Monday 25 March 2024 | 61 | 47 | 59 | 37 | 54 | 33 |
| | Tuesday 26 March 2024 | 62* | 46 | - | - | - | - |

* Measurement not conducted for the full assessment period

Table 1: Summary of typical, measured broadband environmental noise levels

6 ENVIRONMENTAL NOISE PERFORMANCE SPECIFICATION REQUIREMENTS

6.1 Guidance on Noise and vibration Management: Environmental Permits

Published by the Environment Agency (“EA”), Scottish Environment Protection Agency (“SEPA”), Natural Resources Wales (“NRW”) and Northern Ireland Environment Agency (collectively referred to as the “Environment Agencies”) during 23rd July 2021, and subsequently updated 31st January 2022, this guidance sets out the minimum requirements for environmental noise and vibration impact assessments, as required to support a Permit Application. It replaces the Environment Agency’s previous Horizontal Guidance for Noise (H3), Parts 1 and 2. The key requirements of the guidance, which are applicable to this assessment, are as presented below:

- The environmental noise impact assessment must be undertaken in accordance with British Standard BS4142: 2014+A1: 2019: ‘*Method for rating and assessing industrial and commercial sound*’ (BS4142). A summary of this Standard is provided in Section 6.2.
- The acoustic character of the sound generated must be considered. This must consider whether the sound is tonal, impulsive, or intermittent in operation. For industrial noise sources where the sound is neither impulsive nor tonal, but is readily distinguishable against the residual acoustic environment, the Environment Agency will expect a minimum acoustic character correction of +3dB unless otherwise justified.
- The BS4142 defined Background Sound Levels and Residual Sound Levels as used to inform the assessment must not include noise from the Facility. Where it is pre-existing, the Facility must not be operational during the environmental noise level measurements.
- Noise arising from the normal operation of the Facility (as during both so-called “NOC” and “OTNOC” conditions) must not result in a BS4142 defined ‘*significant adverse impact*’ (following consideration of the context) at the surrounding NSRs. The “Environment Agencies” will not issue a Permit where the site is, or predicted to be, operating at (or above) this level.
- As stated above, the guidance recognises that the *context* of the situation can affect the outcome of the BS4142 assessment but states that there are practical limits. The guidance stipulates that it is unlikely to be acceptable to adjust the magnitude of the impact beyond the next BS4142 assessment magnitude band (e.g., suggesting that a Rating Level of around 10dB above the Background Sound level – defined by the Standard as a “significantly adverse” impact, depending on the context - is actually a “low impact” purely on the grounds of context etc.).

Notwithstanding the above, the assessment must demonstrate that Best Available Techniques (BAT) has been applied to prevent or minimise noise emissions.

6.2 BS4142: 2014+A1: 2019 'Method for rating and assessing industrial and commercial sound'

BS 4142: 2014+A1: 2019: *'Method for rating and assessing industrial and commercial sound'* is intended to be used to assess noise of an industrial nature, which includes sound from fixed installations comprising of mechanical and/or electrical plant and equipment. The methods prescribed in this British Standard use outdoor sound levels in order to assess the likely effects of sound on people who might be inside or outside a dwelling or premises that is used for residential purposes upon which sound is incident.

The procedure contained in BS 4142: 2014+A1: 2019 for assessing environmental noise impact is to compare the measured or predicted noise level from the source in question - the "Specific Sound Level" immediately outside the noise sensitive premises - with the corresponding "Background Sound Level". Where the noise contains attention attracting characteristics such as tonal, impulsive and/or intermittent elements, it may be appropriate to apply a correction to the Specific Sound Level in order to obtain the "Rating Level."

BS 4142: 2014+A1: 2019 states that the significance of sound arising from an industrial and/or commercial nature depends upon both the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, and also the context in which the sound occurs:

- a) Typically, the greater this difference, the greater the magnitude of the impact;
- b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- c) A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context;
- d) The lower the Rating Level is relative to the measured Background Sound Level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the Rating Level does not exceed the Background Sound Level, this is an indication of the specific sound source having a low impact, depending on the context.

For the daytime, the assessment is conducted over a one-hour period, and over a 15-minute period at night. The daytime and night time periods are defined as occurring between 07:00 hours to 23:00 hours, and 23:00 hours to 07:00 hours, respectively.

Table 2 provides the typical Background Sound Levels (recorded in the absence of noise from the Facility) at each of the identified NSR which have been used to inform the BS 4142: 2014+A1:2019 assessment:

| Noise Sensitive Receptors | Representative Noise Measurement Position | Typical Background Sound Level, dB $L_{A90,15min}$ |
|---|---|--|
| | | Daytime (07:00 – 19:00 hours) |
| A. Housing on Aber Road (c.230 metres to the west) | 1 | 53 |
| C. Housing on Castle Dyke Street (c.220 metres to the southeast) | 2 | 45 |
| B. Housing on Holywell Road (c.240 metres to the south) | 3 | 47 |
| D. Richard Heights (c.340 metres to the south) | 1 | 53 |

Table 2: Typical Background Sound Levels as each assessed receptor

7 ENVIRONMENTAL NOISE MODEL

7.1 Methodology and Basis of 3D Environmental Noise Models

In order to predict the likely noise levels impinging on the surrounding noise sensitive receptors, proprietary 3D computer noise models were created using the DataKustik “CadnaA” noise mapping software. The following assumptions have been made when generating the noise model:

- (a) The noise model was set up to apply the noise prediction methodology set out in ISO 9613-2: ‘*Acoustics – Attenuation of Sound propagation outdoors – Part 2: General Method of Calculation*’.
- (b) The model was set to include third order reflected noise from solid structures.
- (c) Ground absorption, as defined in ISO 9613-2, has been taken into consideration. The base ground absorption for the model has been set to $G=0.0$ (hard ground). The ground absorption for large areas of soft ground has been set to $G=1.0$.
- (d) The existing land topography of the site and surrounding area up to and including the nearest NSR has been taken into consideration in the assessment. Third party topographical information has been obtained from open source data as available from DEFRA.
- (e) The noise impact as expected the surrounding residential receptors has typically been modelled at a height of 4 metres above local ground level (first floor height). The dwellings at Richmond Heights has been modelled at 30 metres above ground level.
- (f) The noise model assumes that on average up to four HGVs could arrive at and depart from the former scrapyard and Unit 27 as during a typical 1-hour daytime assessment period. No HGVs are expected to arrive at, nor depart from the Facility during any night-time period.
- (g) All externally sited plant noise sources have been modelled as point, line, or area sources, as appropriate, as based on physical size of the plant.
- (h) For modelling purposes, the effective sound power level of each identified noise source has been determined broadly in accordance with the principles presented in International Standard ISO 3744: 2010: ‘*Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods*’, taking into due consideration the physical dimensions of each noise source and the stated sound level. The effective measurement surface area of the noise source at the measurement position, which has been used to derive the sound power level, is stated in Appendix E.

- (i) Noise breakout from internal plant has been modelled by determining the level of noise radiated from the external building fabric of the building, all as based upon the assessment methodology provided within British Standard BS 12354-4:2017 '*Building acoustics Estimation of acoustic performance of buildings from the performance of elements Part 4: Transmission of indoor sound to the outside*'. The sound power level per unit area for each external building element has been determined based on the as measured reverberant sound pressure level within each building. The sound power level per unit area for each external building element has then been determined by applying a "diffusivity term", as defined in BS 12354-4:2017 and subtracting the sound insulation performance of each building face.
- (j) All existing buildings are of a steel frame construction within profiled steel cladding to the wall and roof. Table 3 provides an acoustic specification for the key elements of the external façade to all buildings:

| Building Element | Construction | Sound Reduction Index (SRI, dB) @ Octave Band Centre Frequency (Hz) | | | | | | | dB R_w |
|-------------------|---|---|-----|-----|-----|----|----|----|----------|
| | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | |
| Roof and Cladding | 0.7mm thick DC60 profiled galvanised metal deck | 19 | 20 | 18 | 22 | 18 | 26 | 26 | 22 |

Table 3: Modelled acoustic performance of external building fabric

Figure 6 provides a three-dimensional visualisation of the noise model used to inform the noise impact assessment.

Appendix D provides further information in respect of the 3D computer environmental noise model.

Appendix E provides an inventory of plant and process source noise level data; these form the basis of the 3D noise model underpinning the report. These should not be exceeded.

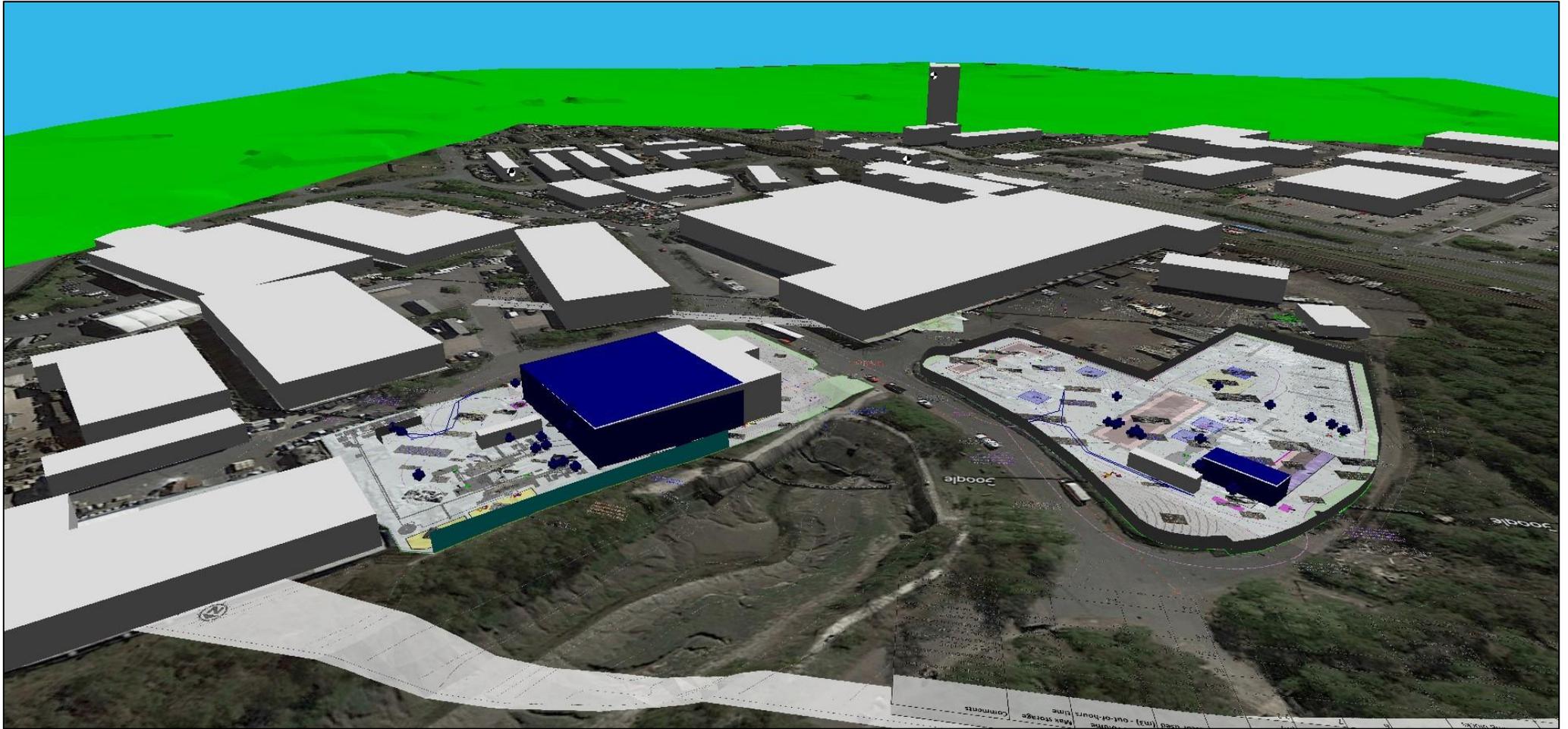


Figure 6: 3D view of the noise model of the Facility (Google 2024)

8 ENVIRONMENTAL NOISE IMPACT ASSESSMENT

8.1 Residential Housing (BS4142 Assessment)

This environmental noise impact assessment has considered three separate scenarios, as follows:

1. Existing plant and processed only
2. Proposed new plant and processes only (as covered under the Permit Variation)
3. All existing and proposed plant and processes, assuming that the Noise Management Plant (“NMP”) has been wholly complied with in its entirety (including maximum allowable plant noise levels and provision of all noise control) as presented in Section 8.2 have been duly implemented.

Table 4 presents the predicted overall A-weighted, BS4142-defined Rating Level at the identified NSRs for each modelled scenario as during the hours of operation (Monday to Sunday 07:00 to 19:00 hours, excluding Bank Holidays).

In all cases, and in accordance with BS4142, a correction of +3dB has been applied to the calculated Specific Sound Level, as arising at the noise sensitive receptors from the Facility, in order to allow for any residual “readily distinctive” acoustic features, in order to determine the BS4142 defined Rating Level for acoustic assessment purposes:

Appendix D provides full details of CadnaA noise maps which present the daytime Specific Sound Levels expected.

| Noise Sensitive Receptor (NSR) | Scenario | Predicted Specific Level, dB $L_{Aeq,T}$ | Acoustic Character Correction, dB | Predicted Rating Level, dB $L_{Ar,T}$ | Typical Background Sound Level, dB L_{A90} | Rating Level sub. Background \pm dB |
|---|--------------------------|--|-----------------------------------|---------------------------------------|--|---------------------------------------|
| A. Housing on Arber Road (c.230 metres to the west) | 1: Existing plant | 56 | +3 | 59 | 53 | +6 |
| | 2: Proposed plant | 44 | +3 | 47 | | -6 |
| | 3: Proposed and existing | 55 | +3 | 58 | | +5 |
| B. Housing on Castle Dyke Street (c.220 metres to the south east) | 1: Existing plant | 51 | +3 | 54 | 45 | +9 |
| | 2: Proposed plant | 35 | +3 | 38 | | -7 |
| | 3: Proposed and existing | 50 | +3 | 53 | | +8 |
| C. Housing on Holywell Road (c.240 metres to the south) | 1: Existing plant | 49 | +3 | 52 | 47 | +5 |
| | 2: Proposed plant | 34 | +3 | 37 | | -11 |
| | 3: Proposed and existing | 48 | +3 | 51 | | +4 |
| D. Richard Heights (c.340 metres to the south) | 1: Existing plant | 57 | +3 | 60 | 53 | +7 |
| | 2: Proposed plant | 44 | +3 | 47 | | -6 |
| | 3: Proposed and existing | 56 | +3 | 59 | | +6 |
| Key Green: low impact (less than or equal to 0dB) Amber: sub-adverse impact to adverse impact (i.e. +1dB to +4dB) Red: adverse to significant adverse impact (+5dB or higher) | | | | | | |

Table 4: BS4142 summary assessment (daytime only 07:00 – 19:00 hours)

Table 4 shows that Rating Level from the existing plant exceeds the typical Background Sound Level by up to +9dB at the worst affected receptor. This is just below the threshold for an indication of a '*... significant adverse impact, depending on the context...*' in BS4142 terms.

Table 4 also shows that Rating Level from the new plant is below the existing Background Sound Level at each of the assessed NSRs. This corresponds to an indication of an '*... low impact, depending on the context...*' in BS4142 terms.

With all proposed and existing plant operating (and with the noise mitigation measures as outlined in Section 8.2 duly implemented), the predicted Rating Level exceeds the typical Background Sound Level by up to +8dB at the worst affected receptor and as during the night time period. This is above the threshold for an indication of an '*... adverse impact, depending on the context...*' in BS4142 terms.

It is therefore the case that the proposed new plant does not increase the magnitude of the existing environmental noise impact and further, the proposed additional noise mitigation measures would be expected to result in a lower noise impact as compared to the pre-existing Facility.

As per above, the predicted magnitude of the impact is subject to the consideration of *context*. In this case, the Facility is located within an existing industrial estate and is currently operational. Industrial noise from the Facility is therefore within the context of its surroundings.

NSRs A, C and D are located adjacent to Holywell Road (A548) which is a busy A Road and thoroughfare through Flint and therefore experience high levels of road traffic noise.

Furthermore, the Facility only operates as during Monday to Sunday, 07:00 to 19:00 hours, excluding Bank Holidays and therefore does not operate at more critical times of the day such as the evening and night time period when occupants of the nearest noise sensitive receptors would typically be expected to be resting, sleeping or preparing to sleep.

Taking the above into consideration, Sol considers that the outcome of the assessment is not required to be amended for the context in which the sound occurs. As such, the existing environmental noise level emissions from the Facility are likely to result in an *adverse impact* at the worst affected NSR.

With all noise mitigation measures duly implemented, the noise model shows that the most significant noise source operating on the sites is the Tana Shark shredder 440 DT, which operates on the former scrapyard. In order to be capable of reducing the magnitude of the noise impact, it would be necessary to consider further additional noise attenuation to this key source. However, Further noise mitigation of the existing shredder is likely to be difficult.

The existing shredder is top loaded via an excavator which means it would not be possible to enclose the existing shredder. The shredder is already screened from the surrounding noise sensitive receptors by intervening buildings and the site boundary acoustic fencing and therefore the use of localised acoustic screening is not expected to be effective acoustically.

In order to effectively reduce the noise levels produced by this activity, it would instead be appropriate to consider replacing the shredder and/or to consider introducing a new hopper and conveying system which will allow for the shredder to be fully enclosed within a purpose built acoustic enclosure.

Safety, maintenance and user access needs, ventilation, fire protection, lighting, visual and maintenance access, health and safety, dust and explosion risk requirements associated with any required acoustic enclosure must all be carefully considered by others, all prior to any finalisation and procurement. Attenuated, fan-assisted (and likely spark arrested) ventilation to the acoustic enclosure shall be needed, complete with separate run and standby fans (plant resilience) and attenuators. This would be a significant and costly undertaking and as such this is not proposed within the current NMP.

8.2 Preliminary Noise Management Plan (NMP)

Appendix E provides a preliminary Noise Management Plan; an itemised list of noise source mitigation measures which form the basis of the calculations and acoustic modelling. The finalised, actual noise mitigation strategy to be implemented must be reviewed, further developed, refined, and approved by Sol. The provisional, outline noise mitigation measures that are assumed to be in place (and are specifically required by this acoustic assessment report) are as summarised below.

Please note that the noise impact from any plant which is not specifically included and listed within Appendix E of this report must be duly assessed. (Sol is to be advised by the Client if this list is not fully exhaustive and inclusive please). The actual/anticipated noise level emissions as expected from the plant must be confirmed and reviewed once available. This assessment must be reviewed and updated by Sol once this information becomes available:

8.2.1 Former Scrapyard

- (a) **Operating times:** The Facility is permitted to operate between 07:00 to 19:00 hours during Monday to Sunday (excluding bank holidays) only.
- (b) **Centrifuge (1 no.):** The existing centrifuge is to be replaced with a new unit. Limited noise level data is currently available but noise data from the supplier states the new unit will achieve a sound pressure level of 85dB $L_{Aeq,T}$. In order to limit uncertainty, acoustic commissioning measurements of the new centrifuge shall be undertaken once installed and operational to ensure this specification is achieved in practice. Provisions for an acoustic enclosure shall be made in the event that the noise level emissions from the new centrifuge exceeds the stated acoustic specification.
- (c) **2.5 metre high acoustic fences:** An existing acoustic fence with a minimum height of 2.5 metres has been installed to the full perimeter of the former scrapyard site. The acoustic fences must be solid, imperforate (with absolutely no gaps), sealed to the base and to provide a surface mass per unit area of at least 12.5 kg/m². The location of the required acoustic fence as used to inform this assessment is shown in Figure 9. Any future amendments to the actual location, layout or construction of the acoustic fence must be approved by Sol prior to any procurement and/or implementation.



- (d) **New agglomeration lines (2 no.):** Once operational, acoustic commissioning measurements of the new agglomeration line shall be undertaken to ensure the acoustic specification is achieved in practice. Provisions for an acoustic enclosure shall be made in the event that the noise level emissions from the new plant exceeds the stated specification.
- (e) **Breeze Bailer (1 no.):** Once operational, acoustic commissioning measurements of the new bailer line shall be undertaken to ensure the acoustic specification is achieved in practice. Provisions for an acoustic enclosure shall be made in the event that the noise level emissions from the new plant exceed the stated specification.

8.2.2 Unit 27

- (f) **Operating times:** The Facility is permitted to operate between 07:00 to 19:00 hours during Monday to Sunday (excluding bank holidays) only.
- (g) **Internal reverberant sound pressure levels:** Table 5 sets out the maximum permissible reverberant sound pressure levels within the Pelleting Line process building which must not be exceeded:

| Location | Period | Maximum Permissible Reverberant Sound Pressure Level (dB $L_{eq,T}$) @ Octave Band Centre Frequency (Hz) | | | | | | | | dB $L_{Aeq,T}$ |
|---------------------------------|----------------------------------|---|-----|-----|-----|----|----|----|----|----------------|
| | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Pelleting Line Process Building | Monday - Sunday 07:00 – 19:00 | 80 | 84 | 86 | 84 | 83 | 83 | 82 | 83 | 90 |
| | Any other time | - | - | - | - | - | - | - | - | - |

Table 5: Maximum permissible reverberant sound pressure levels within the process building

- (h) **Building Extract fan outlet (1 no.):** Noise from the existing exhaust stack outlet must not exceed a sound pressure level of 85dB $L_{Aeq,T}$ at one metre distance from stack outlet edge (and 90° off longitudinal axis of the stack) at any required operating condition/duty/mode. Make provisions for an induct attenuator to be fitted to the outlet of the fan. A photograph of the building extract fan outlet is shown in Figure 7.
- (i) **Tana Shark Shredder 440 DT (1 no.):** No external shredding activities are permitted at Unit 27. The existing externally sited shredder shall only be used as a hopper and conveyor to load pre-shredded material into the wash separation plant. A photograph of the shredder is shown in Figure 8.
- (j) **4 metre high acoustic fence:** An existing acoustic fence with a minimum height of 4 metres has been installed to the west of Unit 27. The acoustic fences must be to be solid, imperforate (with absolutely no gaps), sealed to the base and to provide a surface mass per unit area of at least 12.5 kg/m². The location of the required acoustic fence as used to inform this assessment is shown in Figure 9. Any future amendments to the actual location, layout or construction of the acoustic fence must be approved by Sol prior to any procurement and/or implementation.

8.2.3 *Mobile Plant*

- (k) **General:** All HGVs, loading shovels and forklift trucks etc. under the direct control of the Operator must only use non-intrusive broadband noise type vehicle reversing alarms and/or reversing cameras. There must be no use of pulsed and/or tonal reversing alarms (e.g. reversing beepers).
- (l) **Deliveries:** Deliveries to and from the Facility must only take place between 07:00 to 19:00 hours during Monday to Sunday (excluding bank holidays) only.

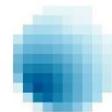


Figure 7: Photograph of the existing building extract fan outlet



Figure 8: Photograph of the existing Tana Shark Shredder 440 DT at Unit 27. *This must only be used for transporting and must not be used for shredding*

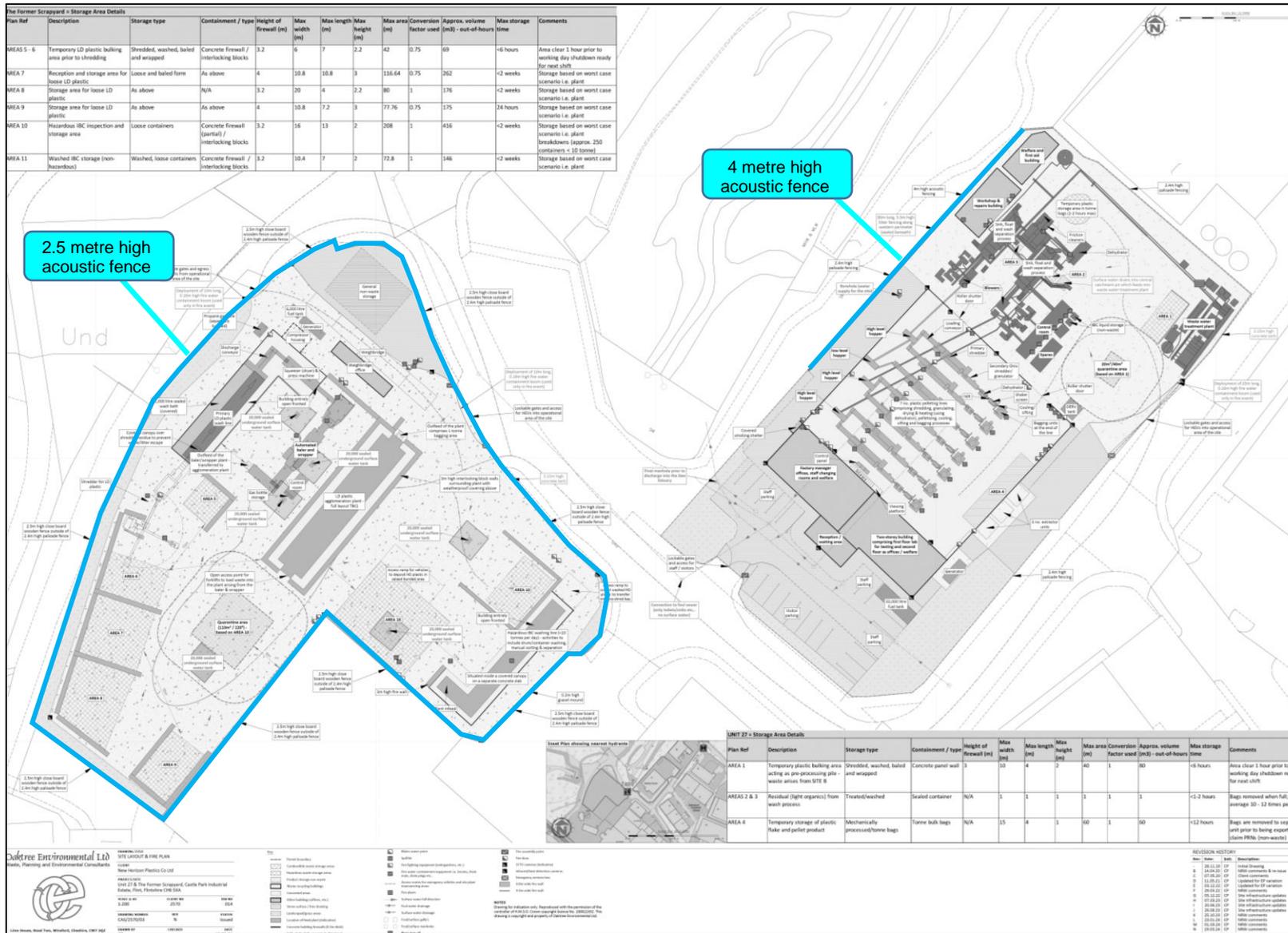


Figure 9: Location and required extent of acoustic fencing installed to the Facility boundary

8.3 Uncertainty

Section 10 of BS4142: 2014 states the following with regards to uncertainty:

'... Consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty. Report the level and potential effects of uncertainty...'

In accordance with the requirements of BS4142, Sol has undertaken the following steps to limit the level of uncertainty in the acoustic assessment:

1. All noise measurements have been carried out using Type 1 Precision Grade noise mounting equipment. All noise measuring instruments have traceable laboratory calibration certification.
2. All noise measurements were accompanied by continuous meteorological measurements as conducted at, or close to, the measurement position in order to ensure that the measurement data was not adversely affected by unfavourable weather conditions.
3. Calculations have been conducted in line with appropriate and nationally recognised acoustic standards (ISO 9613-2, BS12354: 2000), and using proprietary 3D noise modelling software, CadnaA.
4. The assessment assumes downwind propagation in all cases as this represents the worst case.



9 CONCLUSION

Sol has been appointed to provide an environmental noise impact assessment for the New Horizon Plastics Facility that is located at Unit 27 & The Former Scrapyard, Castle Park Industrial Estate, Flint, Flintshire CH6 5XA.

The pre-existing environmental noise climate has been determined by direct measurement at the existing noise sensitive receptors (NSRs). Using this benchmark environmental noise measurement data, it has been possible to set appropriate environmental noise limits for the proposed new plant and processes to be operated at the Facility, all as based on applicable BS 4142:2014+A1: 2019 guidance.

It is the conclusion of this environmental noise impact assessment that the predicted total, aggregate environmental noise impact as arising from the proposed entire operation of the Facility (i.e., all pre-existing and proposed new plant simultaneously operating), albeit assuming full compliance with the additional noise mitigation requirements as specified and presented herein, results in an “adverse” noise impact at the worst affected noise sensitive receptors, all as assessed in accordance with British Standard BS4142: 2014+A1: 2019, provided that noise mitigation measures as specified herein are wholly satisfactorily carried out in their entirety and all anticipated maximum plant noise levels as set out herein (Appendix E et al) are not exceeded in any instance, in practice.

It is the further conclusion of this environmental noise impact assessment that the predicted environmental noise impact specifically arising wholly from the operation of the proposed new plant and processes only in isolation results in a “low impact”.



APPENDIX A
GLOSSARY OF ACOUSTIC TERMS

| Term | Abbreviation | Description |
|-----------------------------------|-------------------------|--|
| Decibel | dB | A scale for comparing the ratios of two quantities, including sound pressure and sound power. |
| A-weighting | dB(A) | The unit of sound level, weighted according to the A-scale, which takes into account the change in sensitivity of the human ear at varying frequencies. |
| Sound Pressure Level | L_{pA} | A measure of the sound pressure at a particular location. Typically expressed in dB(A) referenced to 2×10^{-5} Pascals. |
| Equivalent Continuous Sound Level | $L_{Aeq,T}$ | The steady level of sound over a prescribed period of time which would contain the same total sound energy as the actual fluctuating noise under consideration in the same period of time. |
| Statistical Sound Levels | L_{A10} and L_{A90} | The level of noise exceeded for a percentage of the time period being sampled, namely 10% or 90% respectively. |
| Background Sound Level | $L_{A90,T}$ | The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of the time period being sampled. |
| Maximum Sound Level | L_{Amax} | The maximum sound or noise level determined with instrumentation set to either a fast time weighting, L_{AFmax} , or a slow time weighting, L_{ASmax} , as occurring during the time period being sampled. |
| Sound Power Level | L_{WA} | A measure of the total sound energy radiated from a source. Like sound pressure levels, this is also expressed in dB(A) terms, but it is referenced to 1×10^{-12} W. |
| Broadband | | Sound sampled over a wide range of frequencies. |
| Narrow band | | Sound sampled over a specific, restricted frequency range. Used to ascertain the amplitude and significant of individual, audible tones, and to assist in identifying particular sources of noise within a complex, multi-source soundscape environment. |
| Ambient Sound | $L_{eq,T}$ | Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, both near and far. |
| Specific Sound Level | $L_{eq,T}$ | The Equivalent Continuous A-Weighted Sound Level at an assessment position produced by a specific sound over a given reference time interval, T_r |
| Rating Level | L_{Ar,T_r} | The Specific Sound Level plus any adjustment for the acoustic characteristic features of the noise (e.g. intermittency, tones etc.). |
| Residual Noise | $L_{Aeq,T}$ | The ambient sound remaining at given position in a given situation, when the specific sound source is suppressed to such an extent that it no longer contributes to the ambient sound. |
| Sound Reduction Index | <i>SRI</i> | The reduction in sound energy when transmitted through a panel or similar planar element, typically used in relation to single octave or one-third octave frequency band values. |
| Weighted Sound Reduction Index | R_w | The Sound Reduction Index expressed as a single figure, as expressed against a reference curve. |
| Dynamic Insertion Loss | <i>DIL</i> | Reduction in acoustic energy resulting from the insertion of a noise control element (e.g. an attenuator, acoustic enclosure etc.). |
| Free Field | | Noise measuring location that is free from the presence of sound reflecting objects (except the ground), usually taken to mean being at least 3.5 metres distance from reflective surface(s) or greater. |



**APPENDIX B
 NOISE SURVEY DETAILS AND SUMMARY RESULTS**

LOCATION

Castle Park Industrial Estate, Flint, Wales.

DATES, TIMES, AND WEATHER CONDITIONS

| Date | Daytime (07:00 hours – 23:00 Hours) | | | | Night Time (23:00 hours – 07:00 hours) | | | |
|------------|--|------------|----------------|-----------------------------------|---|------------|----------------|-----------------------------------|
| | Temp, °C | Rain, mm/h | Wind Direction | Mean Wind Speed, ms ⁻¹ | Temp, °C | Rain, mm/h | Wind Direction | Mean Wind Speed, ms ⁻¹ |
| 21/03/2024 | 11 | 0 | SW | 2.1 | 10 | 0 | W | 0.9 |
| 22/03/2024 | 9 | 0 | W | 1.5 | 6 | 0 | W | 1.8 |
| 23/03/2024 | 8 | 0 | W | 2 | 8 | 0 | W | 1.5 |
| 24/03/2024 | 9 | 0 | W | 0.8 | 7 | 0.1 | S | 0.8 |
| 25/03/2024 | 8 | 0 | S | 0.6 | 5 | 0 | N | 0.2 |
| 26/03/2024 | 9 | 0 | E | 0.5 | - | - | - | - |

PERSONNEL

Brian Horner BSc Hons MIOA – Sol Acoustics

Chris Downing MMath – Sol Acoustics

INSTRUMENTATION

Measurement Position 1

01dB Cube Sound level meter (serial no. 11348)

01dB Pre22 Microphone preamplifier (serial no. 1805362)

GRAS 40CD Microphone capsule (serial no. 260642)

01dB Cal21 acoustic calibrator (serial no. 34675320)

Vaisala WXT520 Weather Station

Measurement Position 2

01dB Cube Sound level meter (serial no. 12070)

01dB Pre22 Microphone preamplifier (serial no. 1915040)

GRAS 40CD Microphone capsule (serial no. 288057)

01dB Cal21 acoustic calibrator (serial no. 34675320)

Measurement Position 3

01dB Cube Sound level meter (serial no. 14027)
01dB Pre22 Microphone preamplifier (serial no. 2105097)
GRAS 40CD Microphone capsule (serial no. 428400)
01dB Cal21 acoustic calibrator (serial no. 34675320)

Sound Pressure Level Measurements (Plant Noise Level Measurements)

Norsonic 118 sound level meter (serial no. 28260)
Norsonic 1206 microphone preamplifier (serial no. 30962)
Norsonic 1225 microphone capsule (serial no. 285614)
Norsonic 1251 acoustic calibrator (serial no. 29917)

Sound Intensity Level measurements

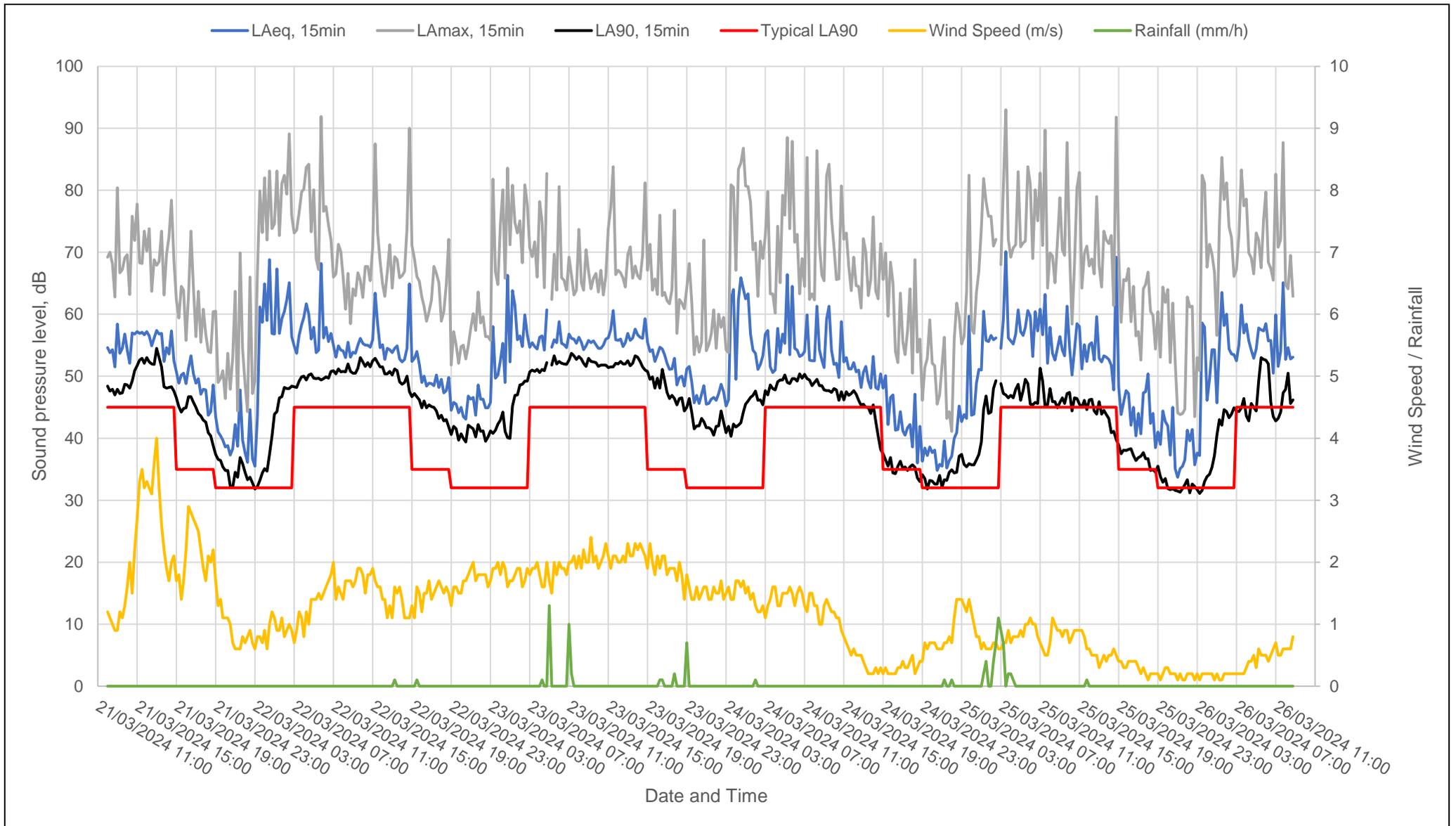
Norsonic 150 sound level meter (serial no. 12942597)
GRAS 26CC microphone preamplifier A (serial no. 450733)
GRAS 40GKmicrophone capsule A (serial no. 450521)
GRAS 26CC microphone preamplifier B (serial no. 450734)
GRAS 40GKmicrophone capsule B (serial no. 450533)
Norsonic 1251 acoustic calibrator (serial no. 29917)
Norsonic 1294 Residual intensity verification coupler (serial no. 12942597)

METHODOLOGY

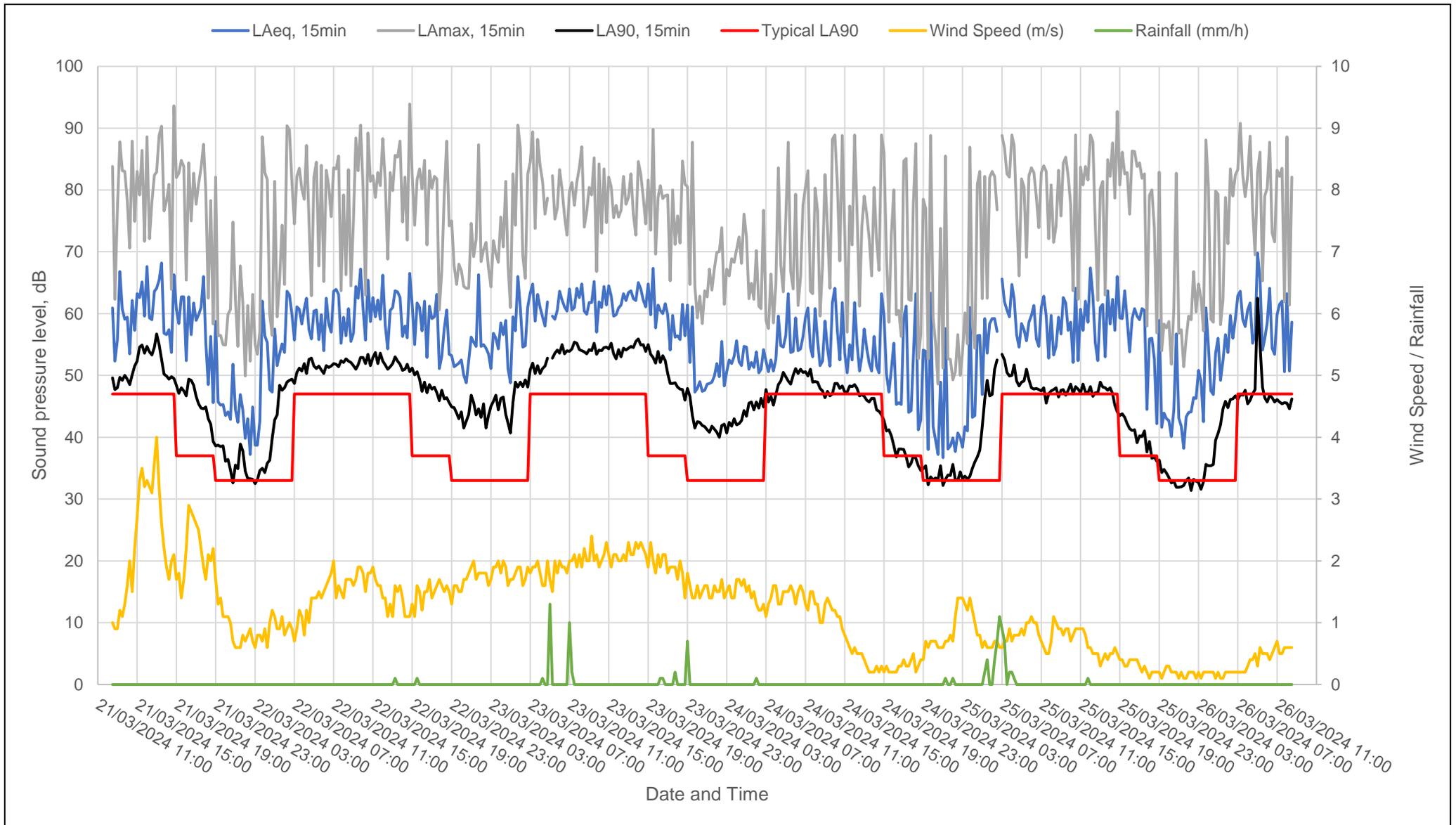
Before and after the measurements the noise monitoring equipment was calibrated to an accuracy of ± 0.1 dB using the Cal 21 Calibrator. The calibrator produces a sound pressure level of 94dB re 2×10^{-5} Pa @ 1kHz.

MEASUREMENT RESULTS

Graphs B1, B2 and B3 summarises the broadband A-weighted results obtained at Measurement Positions 1, 2 and 3 respectively.



Graph B2: A-weighted environmental noise levels at Noise Monitoring Position 2, 21 to 26 March 2024



Graph B3: A-weighted environmental noise levels at Noise Monitoring Position 3, 21 to 26 March 2024

APPENDIX C
SITE PLAN INDICATING THE LOCATION OF THE NOISE SOURCES

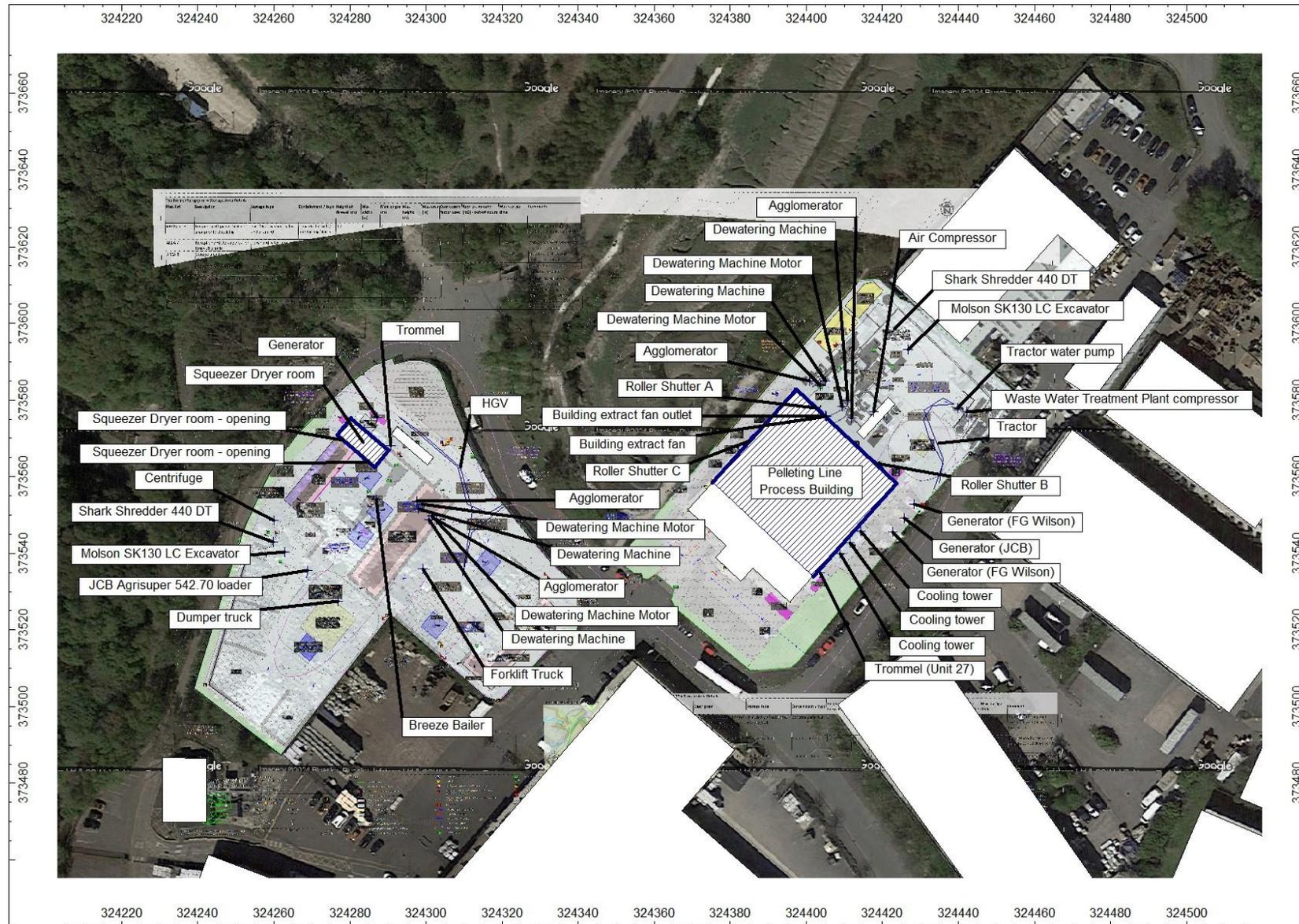


Figure C1: Site plan indicating grid coordinate references x, y coordinates for all external modelled noise sources

APPENDIX D
ENVIRONMENTAL NOISE MODELLING RESULTS



Figure D1: Predicted daytime Specific Sound Level, $L_{Aeq,1hour}$, from the installation, at 4 metres grid height (Google 2024), Scenario 1: existing plant and processed only

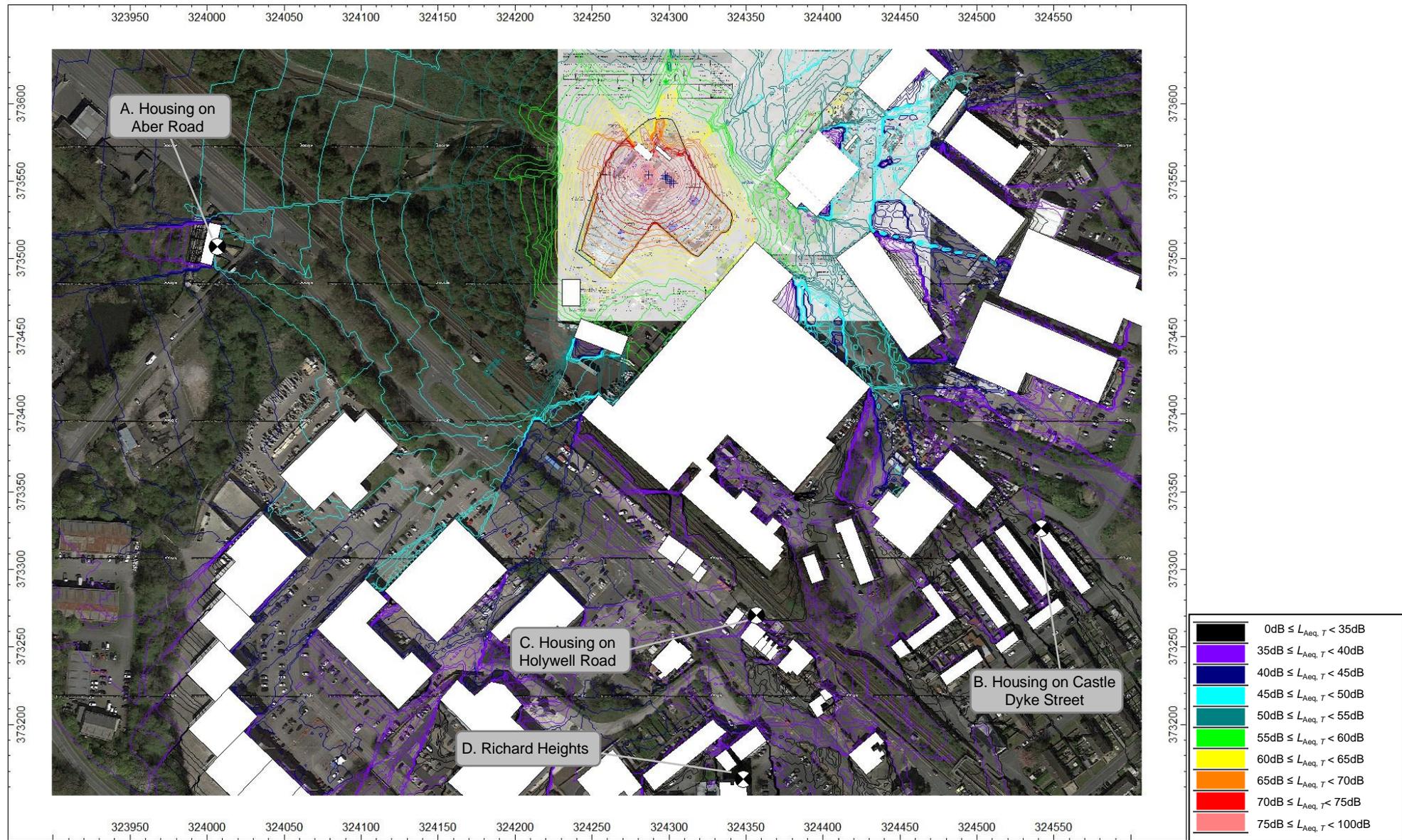


Figure D2: Predicted daytime Specific Sound Level, $L_{Aeq,1hour}$, from the installation, at 4 metres grid height (Google 2024), Scenario 2, proposed new plant and processes only

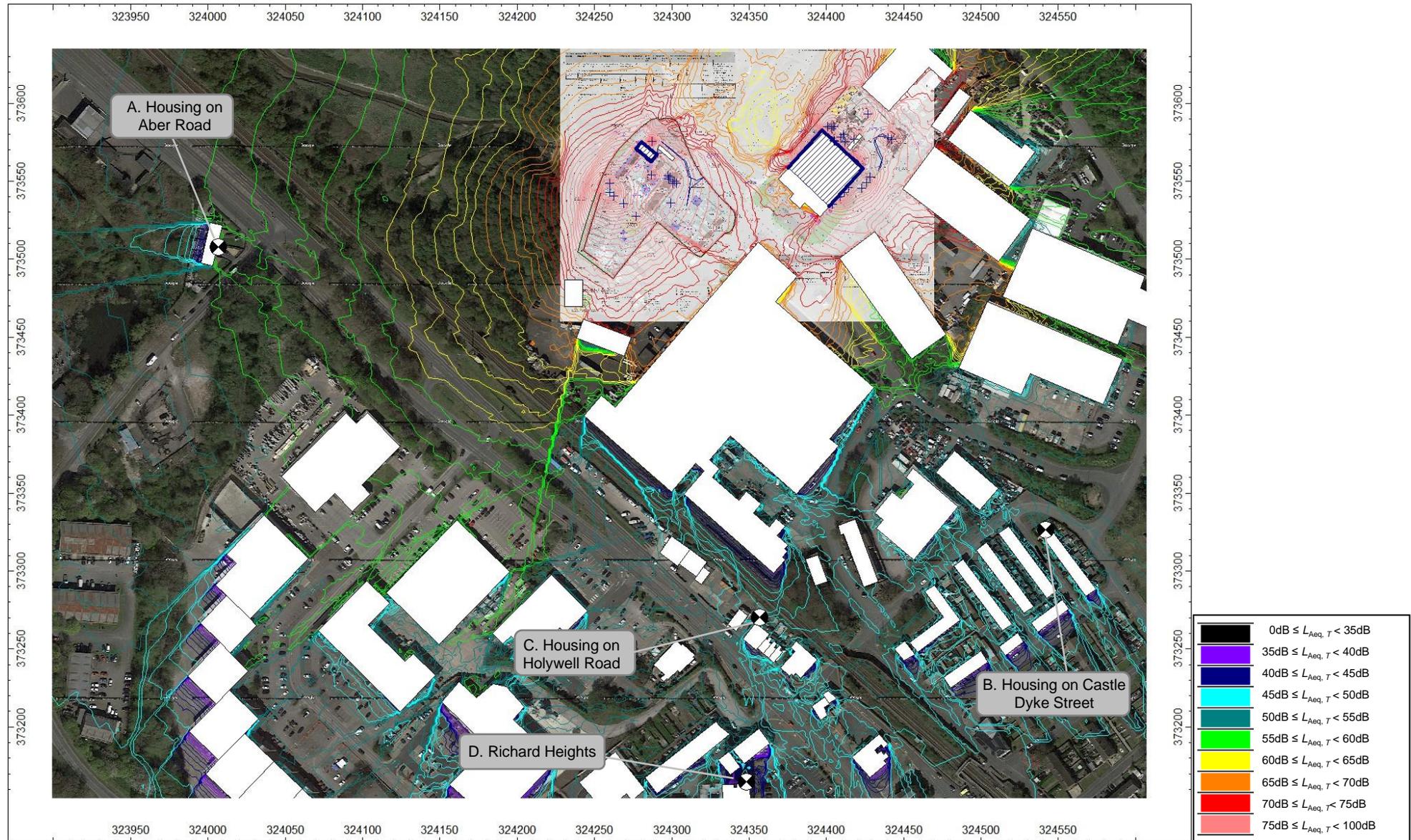


Figure D3: Predicted daytime Specific Sound Level, $L_{Aeq,1hour}$, from the installation, at 4 metres grid height (Google 2024), Scenario 3: all existing and proposed plant + NMP

| A. Housing on Arber Road Predicted Specific Sound Levels Exiting Plant | |
|--|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Shark Shredder 440 DT | 53.4 |
| Centrifuge (Pre NMP) | 51.5 |
| Building extract fan outlet (Pre NMP) | 39.7 |
| JCB Agrisuper 542.70 loader | 39.2 |
| Dumper truck | 39.1 |
| Squeezer Dryer room - opening | 36.3 |
| Molson SK130 LC Excavator | 36.2 |
| Squeezer Dryer room - opening | 36.1 |
| Generator | 34.9 |
| Roller Shutter B | 33.6 |
| Roller Shutter C | 33.2 |
| Molson SK130 LC Excavator | 33.0 |
| Tractor water pump | 31.5 |
| Air Compressor | 29.8 |
| Generator (JCB) | 28.2 |
| HGV | 27.8 |
| Forklift Truck | 27.3 |
| Cooling tower | 26.9 |
| Cooling tower | 26.6 |
| Generator (FG Wilson) | 26.0 |
| Cooling tower | 26.0 |
| Dewatering Machine | 25.6 |
| Waste Water Treatment Plant compressor | 24.8 |
| Roller Shutter A | 24.2 |
| Generator (FG Wilson) | 24.0 |
| Pelleting Line Process Building - Roof | 23.1 |
| Building extract fan | 22.5 |
| Trommel | 22.3 |
| Tractor | 21.3 |
| Pelleting Line Process Building - Facade | 21.3 |
| Squeezer Dryer room - Facade | 16.2 |
| Dewatering Machine Motor | 15.5 |
| Agglomerator | 15.0 |
| Squeezer Dryer room - Roof | 11.8 |
| Dewatering Machine | 11.4 |
| Trommel (Unit 27) | 7.0 |
| Dewatering Machine Motor | 6.6 |
| Agglomerator | -1.9 |
| Total | 56.2 |

Table D1: A. Housing on Arber Road
Specific Sound Levels, existing plant

| A. Housing on Arber Road Predicted Specific Sound Levels Existing Plant (NMP) | |
|---|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Centrifuge (NMP) | 38.2 |
| Building extract fan outlet (NMP) | 24.7 |
| Total | 38.4 |

Table D2: A. Housing on Arber Road
Specific Sound Levels,
Existing Plant (NMP)

| A. Housing on Arber Road Predicted Specific Sound Levels New Plant | |
|--|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Breeze Bailer | 42.9 |
| Dewatering Machine Motor | 30.5 |
| Dewatering Machine | 30.4 |
| Dewatering Machine Motor | 29.5 |
| Dewatering Machine | 29.4 |
| Agglomerator | 18.7 |
| Agglomerator | 18.6 |
| Total | 43.7 |

Table D3: A. Housing on Arber Road
Specific Sound Levels, new plant

| B. Housing on Castle Dyke Street Predicted Specific Sound Levels Exiting Plant | |
|--|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Shark Shredder 440 DT | 44.9 |
| Building extract fan outlet (Pre NMP) | 43.5 |
| Generator (JCB) | 39.0 |
| Cooling tower | 39.0 |
| Cooling tower | 38.7 |
| Cooling tower | 38.7 |
| Generator (FG Wilson) | 37.8 |
| Centrifuge (Pre NMP) | 36.4 |
| Molson SK130 LC Excavator | 36.2 |
| Tractor water pump | 35.2 |
| Generator (FG Wilson) | 34.0 |
| Generator | 32.4 |
| JCB Agrisuper 542.70 loader | 30.7 |
| Dumper truck | 28.3 |
| Air Compressor | 28.2 |
| Waste Water Treatment Plant compressor | 27.1 |
| Roller Shutter B | 27.1 |
| Tractor | 26.6 |
| Trommel (Unit 27) | 26.1 |
| Trommel | 25.9 |
| Molson SK130 LC Excavator | 25.7 |
| Pelleting Line Process Building - Roof | 25.2 |
| Squeezer Dryer room - opening | 25.1 |
| Squeezer Dryer room - opening | 24.7 |
| Pelleting Line Process Building - Facade | 21.9 |
| HGV | 21.7 |
| Building extract fan | 20.0 |
| Roller Shutter A | 19.2 |
| Forklift Truck | 17.5 |
| Dewatering Machine | 16.1 |
| Dewatering Machine | 15.2 |
| Dewatering Machine Motor | 12.6 |
| Dewatering Machine Motor | 10.8 |
| Roller Shutter C | 8.9 |
| Squeezer Dryer room - Facade | 8.1 |
| Squeezer Dryer room - Roof | 6.6 |
| Agglomerator | 2.3 |
| Agglomerator | 2.0 |
| Total | 50.5 |

Table D4: B. Housing on Castle Dyke Street Specific Sound Levels, existing

| B. Housing on Castle Dyke Street Predicted Specific Sound Levels Existing Plant (NMP) | |
|---|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Centrifuge (NMP) | 32.6 |
| Building extract fan outlet (NMP) | 28.5 |
| Total | 34.0 |

Table D5: B. Housing on Castle Dyke Street Specific Sound Levels, Existing Plant (NMP)

| B. Housing on Castle Dyke Street Predicted Specific Sound Levels New Plant | |
|--|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Breeze Bailer | 34.4 |
| Dewatering Machine | 21.2 |
| Dewatering Machine | 21.0 |
| Dewatering Machine Motor | 18.3 |
| Dewatering Machine Motor | 18.0 |
| Agglomerator | 10.1 |
| Agglomerator | 9.7 |
| Total | 35.0 |

Table D6: B. Housing on Castle Dyke Street Specific Sound Levels, new plant

| C. Housing on Holywell Road Predicted Specific Sound Levels Existing Plant | |
|--|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Shark Shredder 440 DT | 45.1 |
| Building extract fan outlet (Pre NMP) | 40.9 |
| Centrifuge (Pre NMP) | 36.3 |
| Cooling tower | 35.9 |
| Cooling tower | 35.9 |
| Cooling tower | 35.9 |
| Generator (JCB) | 33.0 |
| Tractor water pump | 31.6 |
| JCB Agrisuper 542.70 loader | 31.5 |
| Dumper truck | 29.4 |
| Generator (FG Wilson) | 29.0 |
| Generator (FG Wilson) | 29.0 |
| Molson SK130 LC Excavator | 26.4 |
| Generator | 26.3 |
| Squeezer Dryer room - opening | 26.0 |
| Air Compressor | 25.2 |
| Squeezer Dryer room - opening | 25.2 |
| Trommel (Unit 27) | 23.8 |
| Pelleting Line Process Building - Roof | 23.2 |
| Molson SK130 LC Excavator | 22.9 |
| Waste Water Treatment Plant compressor | 22.6 |
| Pelleting Line Process Building - Facade | 22.2 |
| Building extract fan | 19.2 |
| Trommel | 19.1 |
| Roller Shutter A | 18.4 |
| HGV | 17.7 |
| Roller Shutter B | 17.5 |
| Forklift Truck | 17.4 |
| Roller Shutter C | 14.4 |
| Dewatering Machine Motor | 13.4 |
| Tractor | 13.4 |
| Dewatering Machine | 13.0 |
| Dewatering Machine | 10.9 |
| Dewatering Machine Motor | 8.2 |
| Squeezer Dryer room - Facade | 6.6 |
| Squeezer Dryer room - Roof | 3.2 |
| Agglomerator | 2.7 |
| Agglomerator | -0.9 |
| Total | 48.5 |

Table D7: C. Housing on Holywell Road Specific Sound Levels, existing

| C. Housing on Holywell Road Predicted Specific Sound Levels Existing Plant (NMP) | |
|--|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Centrifuge (NMP) | 32.7 |
| Building extract fan outlet (NMP) | 25.9 |
| Total | 33.5 |

Table D8: C. Housing on Holywell Road Specific Sound Levels, Existing Plant (NMP)

| C. Housing on Holywell Road Predicted Specific Sound Levels New Plant | |
|---|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Breeze Bailer | 32.8 |
| Dewatering Machine | 19.8 |
| Dewatering Machine | 19.7 |
| Dewatering Machine Motor | 17.1 |
| Dewatering Machine Motor | 17.0 |
| Agglomerator | 8.7 |
| Agglomerator | 8.7 |
| Total | 33.4 |

Table D9: C. Housing on Holywell Road Specific Sound Levels, New Plant

| D. Richard Heights Predicted Specific Sound Levels Existing Plant | |
|---|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Shark Shredder 440 DT | 54.2 |
| Centrifuge (Pre NMP) | 47.3 |
| Building extract fan outlet (Pre NMP) | 44.2 |
| Cooling tower | 42.8 |
| Cooling tower | 42.7 |
| Cooling tower | 42.6 |
| Generator (JCB) | 42.3 |
| JCB Agrisuper 542.70 loader | 39.7 |
| Generator (FG Wilson) | 38.6 |
| Tractor water pump | 38.1 |
| Generator (FG Wilson) | 38.1 |
| Dumper truck | 37.5 |
| Squeezer Dryer room - opening | 36.7 |
| Squeezer Dryer room - opening | 36.1 |
| Molson SK130 LC Excavator | 36.0 |
| Molson SK130 LC Excavator | 34.8 |
| Generator | 34.0 |
| Waste Water Treatment Plant compressor | 31.2 |
| Trommel (Unit 27) | 30.5 |
| HGV | 28.5 |
| Roller Shutter A | 28.2 |
| Pelleting Line Process Building - Roof | 27.5 |
| Trommel | 27.4 |
| Air Compressor | 26.9 |
| Forklift Truck | 26.6 |
| Dewatering Machine Motor | 25.0 |
| Dewatering Machine | 24.5 |
| Pelleting Line Process Building - Facade | 24.5 |
| Building extract fan | 23.1 |
| Tractor | 22.8 |
| Roller Shutter B | 18.4 |
| Squeezer Dryer room - Facade | 16.6 |
| Dewatering Machine | 15.1 |
| Roller Shutter C | 11.3 |
| Dewatering Machine Motor | 10.7 |
| Squeezer Dryer room - Roof | 9.6 |
| Agglomerator | 3.2 |
| Agglomerator | 2.4 |
| Total | 56.8 |

Table D10: D. Richard Heights Specific Sound Levels, existing

| D. Richard Heights Predicted Specific Sound Levels Existing Plant (NMP) | |
|---|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Centrifuge (NMP) | 38.7 |
| Building extract fan outlet (NMP) | 29.2 |
| Total | 39.2 |

Table D11: D. Richard Heights Specific Sound Levels, Existing Plant (NMP)

| D. Richard Heights Predicted Specific Sound Levels New Plant | |
|--|--------------------------------------|
| Source Description | Specific Sound Level, dB $L_{Aeq,T}$ |
| Breeze Bailer | 43.1 |
| Dewatering Machine Motor | 30.4 |
| Dewatering Machine | 30.3 |
| Dewatering Machine | 30.2 |
| Dewatering Machine Motor | 29.8 |
| Agglomerator | 20.0 |
| Agglomerator | 19.0 |
| Total | 43.9 |

Table D12: D. Richard Heights Specific Sound Levels, new plant

APPENDIX E
NOISE SOURCE SCHEDULE

| Equipment Name | Data Source / Specification | Data Type | Number of Sources | Average Sound Pressure Level, dB, at Octave Band Centre Frequency Hz | | | | | | | | | | Average Sound Pressure Level on Measurement Surface, L_{pA} | Measurement Distance, m | Measurement Surface area at Measurement Position, m^2 | Overall Sound Power Level, dB L_{WA} | Utilisation | | Source: Area (A) Line (L) Point (P) or internal (I) | Comment | Outline Noise Mitigation Design |
|-----------------------------|---|--------------------------------------|-------------------|--|----|-----|-----|-----|----|----|----|----|-------------------------|---|-------------------------|---|--|----------------|-----|--|--|---------------------------------|
| | | | | 32 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Daytime (07:00 - 17:00) | | | | | Any Other Time | | | | |
| Former Scrapyard | | | | | | | | | | | | | | | | | | | | | | |
| Existing | | | | | | | | | | | | | | | | | | | | | | |
| Internal | | | | | | | | | | | | | | | | | | | | | | |
| Squeezer Dryer room | On site measurement during 26 March 2024 | Internal reverberant SPL | 1 | 79 | 77 | 78 | 82 | 79 | 80 | 80 | 78 | 70 | 86 | n/a | n/a | n/a | 100% | 0% | I | | | |
| External | | | | | | | | | | | | | | | | | | | | | | |
| Wash line | On site observation during 26 March 2024 | n/a | | | | | | | | | | | 7 | | | | 100% | 0% | n/a | Quiet, not measurable | | |
| Centrifuge | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 94 | 95 | 90 | 88 | 84 | 84 | 95 | 79 | 71 | 97 | 1 | 51 | 114 | 100% | 0% | P | | The existing centrifuge is to be replaced with a new unit. Limited noise level data is currently available but noise data from the supplier states the new unit will achieve a sound pressure level of 85dB $L_{Aeq,T}$. In order to limit uncertainty, acoustic commissioning measurements of the new centrifuge shall be undertaken once installed and operational to ensure this specification is achieved in practice. Provisions for an acoustic enclosure shall be made in the event that the noise level emissions from the new centrifuge significantly exceed the stated specification | |
| | Maximum permissible sound pressure level | Sound Pressure Level at 1m distance | 1 | | | | 94 | | | | | | 85 | 1 | 51 | 102 | | | | | | |
| Tanan Shark Shredder 440 DT | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 84 | 87 | 93 | 92 | 91 | 89 | 89 | 85 | 76 | 95 | 1 | 286 | 120 | 100% | 0% | P | Manufacturer noise data states Shark Shredder 440 DT rated as 120dB L_{WA} | | |
| Molson SK130 LC Excavator | Noise spectrum taken from BS5228 Part 1 2009, Table C.2, ref. no.5 "Tracked Excavator 72kW" | Sound Pressure Level at 10m distance | 1 | | 78 | 70 | 72 | 68 | 67 | 66 | 73 | 65 | 76 | 10 | 628 | 104 | 100% | 0% | P | | | |
| JCB Agrisuper 542.70 loader | Noise spectrum taken from BS5228 Part 1 2009, Table C.2, ref. no.28 "Wheeled loader 170kW" | Sound Pressure Level at 10m distance | 1 | | 86 | 82 | 77 | 74 | 70 | 66 | 62 | 55 | 76 | 10 | 628 | 104 | 100% | 0% | P | | | |
| 9 Tonne Dumper truck | Noise spectrum taken from BS5228 Part 1 2009, Table C.4, ref. no.4 "Dumper 9tonne" | Sound Pressure Level at 10m distance | | | 82 | 76 | 75 | 74 | 68 | 68 | 64 | 55 | 76 | 10 | 628 | 103 | 100% | 0% | P | | | |
| Forklift Truck | Noise spectrum taken from BS5228 Part 1 2009, Table C.9, ref. no.5 | Sound Pressure Level at 10m distance | 1 | | 72 | 67 | 61 | 62 | 60 | 57 | 52 | 47 | 65 | 10 | 628 | 93 | 100% | 0% | P | | | |
| Trommel | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 78 | 78 | 78 | 76 | 71 | 69 | 66 | 63 | 58 | 75 | 1 | 63 | 93 | 100% | 0% | P | | | |

| Equipment Name | Data Source / Specification | Data Type | Number of Sources | Average Sound Pressure Level, dB, at Octave Band Centre Frequency Hz | | | | | | | | Average Sound Pressure Level on Measurement Surface, L_{pA} | Measurement Distance, m | Measurement Surface area at Measurement Position, m^2 | Overall Sound Power Level, dB L_{WA} | Utilisation | | Source: Area (A) Line (L) Point (P) or internal (I) | Comment | Outline Noise Mitigation Design | |
|---|---|--|-------------------|--|-----|-----|-----|-----|----|----|----|---|-------------------------|---|--|-------------|-------------------------|---|---------|---|---|
| | | | | 32 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | | | | | 8k | Daytime (07:00 - 17:00) | | | | Any Other Time |
| Generator (FG Wilson) | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 83 | 79 | 84 | 87 | 74 | 73 | 69 | 63 | 56 | 81 | 1 | 88 | 100 | 100% | 0% | P | Manufacturer noise data states FG Wilson generator rated as 98dB L_{WA} | |
| HGV | Sound pressure Level at 10m | Noise spectrum taken from BS5228 Table C.2 reference 34 ("Lorry": 4-axle wagon). | 1 | | 73 | 78 | 78 | 78 | 74 | 73 | 68 | 66 | 80 | 10 | 628 | 108 | 1/hour | nil | I | | Deliveries to and from the Facility must only take place between 07:00 – 19:00 hours during Monday to Sunday (excluding bank holidays) only. |
| Proposed | | | | | | | | | | | | | | | | | | | | | |
| Breeze Bailer | Maximum permissible sound pressure level | Sound Pressure Level at 2m distance | 1 | 77 | 85 | 85 | 83 | 81 | 78 | 79 | 76 | 68 | 85 | 2 | 252 | 109 | 100% | 0% | P | Manufacturer supplied noise data | Once operational, acoustic commissioning measurements of the new bailer line shall be undertaken to ensure the acoustic specification is achieved in practice. Provisions for an acoustic enclosure shall be made in the event that the noise level emissions from the new centrifuge significantly exceed the stated specification |
| Dewatering Machine Motor | Maximum permissible sound intensity level | Sound intensity level | 2 | 94 | 86 | 85 | 77 | 78 | 78 | 81 | 74 | 70 | 85 | 0.2 | 10 | 95 | 100% | 0% | P | Noise data taken from measurements of existing plant on Unit 27 | Once operational, acoustic commissioning measurements of the new agglomeration lines shall be undertaken to ensure the acoustic specification is achieved in practice. Provisions for an acoustic enclosure shall be made in the event that the noise level emissions from the new centrifuge significantly exceed the stated specification |
| Dewatering Machine | Maximum permissible sound intensity level | Sound intensity level | 2 | 94 | 87 | 84 | 83 | 76 | 74 | 76 | 76 | 71 | 83 | 0.2 | 22 | 96 | 100% | 0% | P | Noise data taken from measurements of existing plant on Unit 27 | |
| Agglomerator | Maximum permissible sound intensity level | Sound intensity level | 2 | 78 | 79 | 77 | 70 | 71 | 67 | 64 | 68 | 55 | 74 | 0.2 | 13 | 85 | 100% | 0% | P | Noise data taken from measurements of existing plant on Unit 27 | |
| Unit 27 Existing Internal | | | | | | | | | | | | | | | | | | | | | |
| Pelleting Line Process Building | On site measurement during 26 March 2024 | Internal reverberant SPL | 1 | 81 | 80 | 84 | 86 | 84 | 83 | 83 | 82 | 83 | 90 | n/a | n/a | n/a | 100% | 0% | I | | |
| External | | | | | | | | | | | | | | | | | | | | | |
| Waste Water Treatment Plant 11kW compressor | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 89 | 89 | 83 | 80 | 82 | 75 | 76 | 73 | 72 | 83 | 1 | 40 | 99 | 100% | 0% | P | | |
| Tractor | Noise spectrum taken from BS5228 Part 1 2009, Table C.4, ref. no.74 "Tractor (towing equipment)"" | Sound Pressure Level at 10m distance | 1 | | 79 | 71 | 78 | 75 | 78 | 70 | 61 | 55 | 80 | 10 | 628 | 108 | 100% | 0% | L | | |
| Tractor water pump | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 83 | 108 | 101 | 104 | 95 | 86 | 84 | 79 | 77 | 98 | 1 | 16 | 110 | 50% | 0% | P | | |
| Air Compressor | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 84 | 84 | 82 | 99 | 83 | 79 | 76 | 73 | 69 | 91 | 1 | 49 | 108 | 100% | 0% | P | | |

| Equipment Name | Data Source / Specification | Data Type | Number of Sources | Average Sound Pressure Level, dB, at Octave Band Centre Frequency Hz | | | | | | | | Average Sound Pressure Level on Measurement Surface, L_{PA} | Measurement Distance, m | Measurement Surface area at Measurement Position, m^2 | Overall Sound Power Level, dB L_{WA} | Utilisation | | Source: Area (A) Line (L) Point (P) or internal (I) | Comment | Outline Noise Mitigation Design | |
|-----------------------------|---|--------------------------------------|-------------------|--|----|-----|-----|-----|----|----|----|---|-------------------------|---|--|-------------|-------------------------|---|---------|--|---|
| | | | | 32 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | | | | | 8k | Daytime (07:00 - 17:00) | | | | Any Other Time |
| Building extract fan | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 85 | 84 | 90 | 88 | 89 | 84 | 80 | 78 | 75 | 90 | 1 | 33 | 105 | 100% | 0% | P | | |
| Building extract fan outlet | No data available. Assumed noise from the outlet achieves 100dB $L_{Aeq,T}$ at 1m | Sound Pressure Level at 1m distance | 1 | | | | 109 | | | | | | 100 | 1 | 6 | 108 | 100% | 0% | P | Noise from the existing exhaust stack outlet must not exceed a sound pressure level of 85dB $L_{Aeq,T}$ at one metre distance from stack outlet edge (and 90° off longitudinal axis of the stack) at any required operating condition/duty/mode. Make provisions for an induct attenuator to be fitted to the outlet of the fan. | |
| | Maximum permissible sound pressure level | Sound Pressure Level at 1m distance | 1 | | | | 94 | | | | | | 85 | 6 | 93 | | | | | | |
| Roller Shutter A | On site measurement during 26 March 2024 | Sound Pressure Level at opening | 1 | 85 | 82 | 88 | 94 | 94 | 90 | 87 | 83 | 82 | 95 | 0 | 13 | 106 | 100% | 0% | A | Measured at opening | |
| Roller Shutter B | On site measurement during 26 March 2024 | Sound Pressure Level at opening | 1 | 83 | 80 | 84 | 85 | 82 | 84 | 85 | 83 | 84 | 91 | 0 | 24 | 105 | 100% | 0% | A | Measured at opening | |
| Roller Shutter C | On site measurement during 26 March 2024 | Sound Pressure Level at opening | 1 | 82 | 77 | 82 | 83 | 80 | 80 | 81 | 79 | 78 | 87 | 0 | 13 | 98 | 100% | 0% | A | Measured at opening | |
| Dewatering Machine Motor | On site measurement during 26 March 2024 | Sound intensity level | 2 | 94 | 86 | 85 | 77 | 78 | 78 | 81 | 74 | 70 | 85 | 0.2 | 10 | 95 | 100% | 0% | P | | |
| Dewatering Machine | On site measurement during 26 March 2024 | Sound intensity level | 2 | 94 | 87 | 84 | 83 | 76 | 74 | 76 | 76 | 71 | 83 | 0.2 | 22 | 96 | 100% | 0% | P | | |
| Agglomerator | On site measurement during 26 March 2024 | Sound intensity level | 2 | 78 | 79 | 77 | 70 | 71 | 67 | 64 | 68 | 55 | 74 | 0.2 | 13 | 85 | 100% | 0% | P | | |
| Tana Shark Shredder 440 DT | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 286 | - | 100% | 0% | P | Manufacturer noise data states Shark Shredder 440 DT rated as 120dB L_{WA} | No external shredding activities are permitted at Unit 27. The existing externally sited shredder shall only be used as a hopper and conveyor to load pre-shredded material into the wash separation plant. |
| Molson SK140 SR Excavator | Noise spectrum taken from BS5228 Part 1 2009, Table C.2, ref. no.5 "Tracked Excavator 72kW" | Sound Pressure Level at 10m distance | 1 | | 78 | 70 | 72 | 68 | 67 | 66 | 73 | 65 | 76 | 10 | 628 | 104 | 100% | 0% | P | | |
| Generator (FG Wilson) | Manufacturer noise data states FG Wilson generator rated as 101dB L_{WA} . Typical noise data assumed | Sound Pressure Level at 1m distance | 2 | 84 | 80 | 85 | 88 | 75 | 74 | 70 | 64 | 57 | 82 | 1 | 88 | 101 | 100% | 0% | P | Manufacturer noise data states FG Wilson generator rated as 101dB L_{WA} | |

| Equipment Name | Data Source / Specification | Data Type | Number of Sources | Average Sound Pressure Level, dB, at Octave Band Centre Frequency Hz | | | | | | | | Average Sound Pressure Level on Measurement Surface, L_{pA} | Measurement Distance, m | Measurement Surface area at Measurement Position, m^2 | Overall Sound Power Level, dB L_{WA} | Utilisation | | Source: Area (A) Line (L) Point (P) or internal (I) | Comment | Outline Noise Mitigation Design | |
|-------------------|---|-------------------------------------|-------------------|--|----|-----|-----|-----|----|----|----|---|-------------------------|---|--|-------------|-------------------------|---|---------|--|----------------|
| | | | | 32 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | | | | | 8k | Daytime (07:00 - 17:00) | | | | Any Other Time |
| Generator (JCB) | Manufacturer noise data states JCB generator rated as 105dB L_{WA} Typical noise data assumed | Sound Pressure Level at 1m distance | 1 | 88 | 84 | 89 | 92 | 79 | 78 | 74 | 68 | 61 | 86 | 1 | 88 | 105 | 100% | 0% | P | Manufacturer noise data states JCB generator rated as 105dB L_{WA} | |
| Cooling Towers | No data available. Assumed noise from the cooling towers meets 85dB $L_{Aeq,T}$ at 1m | Sound Pressure Level at 1m distance | 3 | | | | 94 | | | | | | 85 | 1 | 64 | 103 | 100% | 0% | P | | |
| Trommel (Unit 27) | On site measurement during 26 March 2024 | Sound Pressure Level at 1m distance | 1 | 78 | 78 | 78 | 76 | 71 | 69 | 66 | 63 | 58 | 75 | 1 | 63 | 93 | 100% | 0% | P | | |

Table E1: Noise source schedule indicating maximum permissible noise levels (per plant item) and outline noise mitigation required

APPENDIX F
CLIENT SUPPLIED NOISE DATA



TECHNICAL SPECIFICATION

| Specification | | |
|-------------------------|---|--|
| Roll-on roll-off frame | according to Swedish standard height, adjustable hook (mm) length of roll-on roll-off frame (mm) | SS 3021 1450 / 1570 6 280 |
| Dimensions | maximum length, transport mode (mm) maximum width, transport mode (mm) maximum height, transport mode (mm) maximum height, working mode (mm) | 7 250 2 600 2 700 4 100 |
| Weight | (kg) | 13 000 |
| Operation | | electro hydraulic |
| Noise | In average when baling, at 2m distance (dB (A)) | 85 |
| Electrical data | drive voltage operating voltage (V) installed power (kW) normal power consumption (kW) number of electric motors, manufacturer protection rating (water- and dust proof) contactors, block, relay, manufacturer safety relays, circuit breakers, manufacturer fuses, manufacturer | 400V 3-fas 50Hz ±10% 24 30 15 2, BUSCK Min IP54 Allen Bradley / Phoenix Allen Bradley Allen Bradley |
| Hydraulics data | number of hydraulic pumps, manufacturer number of hydraulic motors, manufacturer number of hydraulic cylinders, manufacturer gear boxes, manufacturer oil capacity, hydraulic system (liters) hydraulic oil type maximum oil pressure (bar) | 5 pcs, Atos / Marzocchi 6 pcs, SAI / M+S 17 pcs, Skillingar./Parker STP / Bonfiglioli / Varvel 450 ISO VG 32 210 |
| Control system | PLC, manufacturer PLC, model control panel | Mikrodata Myloc 100 Myloc 100 |
| Radio control equipment | 4 channel radio control system, manufacturer | Tele Radio AB |
| Wrapping unit | off-loading height (mm) model number of stretch film rolls bale diameter (mm) plastic stretching (%) | 1800 sweep arm 1 pc approx. 1200 approx. 55 |

Figure F1: Noise data for press breeze bailer



| W 智楷分离科技 OF SEPARATION TECHNOLOGY | | Decanter centrifuge test report | | | | Document number: xbsy.zk/8.2.4-10/1 | | |
|---|-------------------------------|--|-----------------------------------|-------------------------------|----------------------------------|--|--------------------|-------|
| Chengdu Zhikai Separation Technology Co., Ltd | | Factory number | | Use the manufacturer | | Zibo Liantongda Import & Export Co., Ltd | | |
| Centrifuge model | LW520X2150B | HI 23032 | | date | | January 8, 2024 | | |
| Tester | Zhiyong Shi | Inspectors | Yongjun Zhang | | | | | |
| Main motor speed (r/min) | | Drum speed (r/min) | Auxiliary motor speed (r/min) | | Differential ratio | | Differential speed | |
| 2970 | | 3200 | 1480 | | 96 | | 16.1 | |
| Main motor current (A) | | 28.5 | Auxiliary motor current (A) | | 15.2 | Auxiliary motor torque (%) | 2.8 | |
| Lubrication station | Oil pump motor current (A) | / | Rated power (kW) | / | Left return oil temperature (°C) | | / | |
| | Feed bearing temperature (°C) | / | Right return oil temperature (°C) | / | Inlet bearing pressure (MPa) | | / | |
| Vibration intensity (mm/s) | | Measurement points | No load test | | | | | |
| | | | Left bearing (differential end) | | | Right bearing (feed pipe end) | | |
| | | | Rmin | Rmax | Vrms | Rmin | Rmax | Vrms |
| | Vx | 4.0 | 4.4 | 4.2 | 4.8 | 5.4 | 5.2 | |
| | Vy | 4.4 | 5.2 | 4.8 | 5.2 | 5.6 | 5.4 | |
| | Vz | 2.3 | 2.4 | 2.3 | 2.2 | 2.3 | 2.2 | |
| Measuring instrument | AWA5936 vibration meter | | Testing methods | | Contact type | | | |
| Vibration | 5.4 | | Vibration evaluation | | Qualified | | | |
| Noise (dB) | Measurement points | No load test | | | | | | |
| | | Background | | Front | Back | Left | Right | Upper |
| | LP (count) | The slag discharge and liquid hopper are not sealed, and the transmission cover is not covered | | 78 | 84 | 84 | 83 | 85 |
| | Measuring instruments | HS5636 sound level meter | | Testing methods | | Non-contact | | |
| LP (A 计数) | 85 | | Noise evaluation | | Qualified | | | |
| Temperature rise (°C) | Measurement location | No load test | | | | | | |
| | | Left bearing (differential end) | | Right bearing (feed pipe end) | | Differential | | |
| | Temperature | 34.5°C | | 26.7°C | | 19.8°C | | |
| | Temperature rise | 23.5°C | | 15.7°C | | 8.8°C | | |
| | Measuring instruments | Infrared radiation thermometer | | Testing methods | | Non-contact | | |
| Room | 11°C | | Evaluation | | Qualified | | | |

Figure F2: Noise data for the replacement centrifuge

APPENDIX G
DETAILS AND PROFESSIONAL QUALIFICATIONS OF CONTRIBUTING SOL STAFF

Company Details

Name of Organisation: Sol Acoustics Limited

Status: Private Limited Company

Address: Unit 11, Brunel Court,
Gadbrook Park
CW9 7LP

Telephone Number: 01565 632535

E-Mail: info@solacoustics.co.uk

Nature of Business: Acoustic Consultancy

Directors: Simon Ferenczi

Company Registration Number: 4218702

Key Technical Personnel & Qualifications

| | |
|----------------|--|
| Simon Ferenczi | Institute of Acoustics Diploma (with additional modules), MIOA |
| Brian Horner | BSc (Hons), MIOA |
| Chris Downing | MMath |

Company Accreditations

Sol Acoustics is a member of The Association of Noise Consultants (ANC) and is qualified to perform sound insulation testing under the ANC's accredited testing scheme to demonstrate compliance with the requirements of Approved Document E of the Building Regulations.