



Noise Assessment: Aggregate Recycling Facility, Heol-y-Splot, Bridgend

February 2021



Experts in noise and vibration
assessment and management

Document Control

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Executive Summary

Noise Consultants Ltd (NCL) have undertaken an environmental sound assessment in order to determine the likely impact of sound from a proposed aggregate recycling facility (the 'proposed development') at land adjacent to Heol-y-Splot, Bridgend (the 'site').

The sound assessment was carried out in accordance with the requirements set out by Bridgend County Borough Council Shared Regulatory Services, namely guidance provided in BS 4142:2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'* (BS 4142:2014+A1:2019).

Sound monitoring was undertaken at locations in the vicinity of the closest noise sensitive receptors (NSR), and the measured levels used to inform a BS 4142:2014+A1:2019 assessment.

A sound propagation model of the proposed development was constructed within Stapelfeldt's LimA® computational sound modelling suite (v2020), which enabled prediction of the likely specific sound/rating levels at the NSR.

Initial results from the modelling indicated that sound levels generated from the proposed development would result in an adverse impact at the NSR, and further noise modelling was undertaken that incorporated noise barriers for mitigation.

The BS 4142:2014+A1:2019 assessment outcome has demonstrated that the rating level from the proposed development with the addition of mitigation is likely to have a '**Low Impact**'.

Additionally, an assessment of the likely change in ambient sound levels as a result of the operation of the proposed development has been undertaken. The assessment demonstrated that the operation of the proposed development is unlikely to cause an increase to the existing ambient sound level at the NSR.

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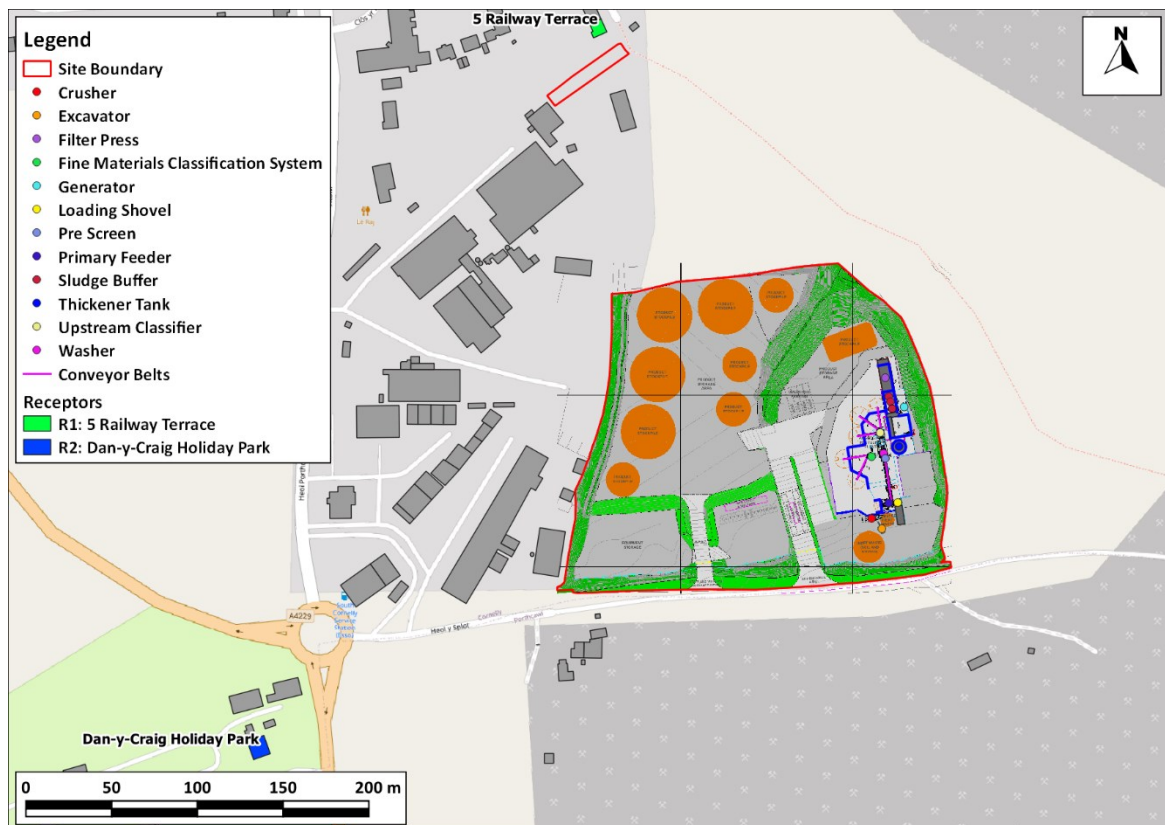
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1 Introduction

- 1.1 Noise Consultants Ltd ('NCL') have carried out an assessment in accordance with BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS 4142:2014+A1:2019) on behalf of Wellshill Civils & Plant Ltd, to assess the potential impact of sound upon the nearest noise sensitive receptors (NSR) as a result of the proposed aggregate recycling facility (the 'proposed development'), located on land adjacent to Heol-y-Splot in Bridgend, Wales (the 'site').
- 1.2 The assessment sets out the results of a baseline sound survey and the likely impacts of sound upon NSR from the operation of the proposed development.
- 1.3 This report has been prepared taking into account all relevant local and national policy, guidance and regulations.

Site and Development Details

- 1.4 The proposed development comprises an aggregates recycling plant, office, staff welfare building, weighbridge office, storage and ancillary works. It is proposed to operate from 07:00 to 19:00 Mondays to Fridays, and 08:00 to 13:00 on Saturdays, Sundays and Bank or Public Holidays. It will process up to 200,000 tonnes of construction and demolition waste per annum. The construction and demolition waste is crushed, then passed by a conveyor into the aggregates recycling plant where it is sized through a series of wet and dry screening stages. The sized aggregates then fall into storage bays beneath the recycling plant.
- 1.5 The site is currently unoccupied and is located directly east of the South Cornelly Trading Estate, with the A4229 located approximately 150m west of the site boundary and it is bounded to the south by Heol-y-Splot.
- 1.6 The closest NSR have been identified as:
- R1: Dwelling at 5 Railway Terrace; and
 - R2: Dwelling at Dan-y-Craig Holiday Park.
- 1.7 **Figure 1** presents the site boundary, the relative locations of the surrounding noise sources, the location of the layout of the proposed development and the NSR.

Figure 1: Site Boundary, Layout and Nearest NSR

Local Authority - Consultation

- 1.8 NCL have been in correspondence with Bridgend County Borough Council's (BCBC) Shared Regulatory Services (SRS), outlining a proposed noise assessment scope and methodology with the aim of seeking agreement on the noise assessment methodology prior to any assessment works taking place.
- 1.9 Shared Regulatory Services is a partnership between Bridgend Council, Cardiff Council and the Vale of Glamorgan Council responsible for public protection, including issues relating to noise.
- 1.10 In consultation with BCBC's SRS it was agreed that the methodologies advocated in BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' would be appropriate for the assessment of sound from the proposed development. In addition, the scope of the baseline noise monitoring was agreed and carried out by NCL.

2 Assessment Criteria

National Planning Policy

Planning Policy Wales, Edition 10 (PPW,2018)

- 2.1 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. The document makes several references to the acoustic environment; of most relevance in this case is paragraph 6.7.14, which falls under section 6 Distinctive and Natural Places, sub-section 6.7 Air Quality and Soundscape, stating that:

“Proposed development should be designed wherever possible to prevent adverse effects to amenity, health and the environment but as a minimum to limit or constrain any effects that do occur. In circumstances where impacts are unacceptable, for example where adequate mitigation is unlikely to be sufficient to safeguard local amenity in terms of air quality and the acoustic environment it will be appropriate to refuse permission.”

- 2.2 Therefore, PPW recognises that the adverse effects of sound should be minimised and that unacceptable effects should be prevented.

Technical Advice Note (Wales) 11: Noise (TAN11, 1997)

- 2.3 PPW is supplemented by a series of Technical Advice Notes (TANs), with TAN11 relating to noise. Paragraph 8 relates to noise generating development and states that:

“Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance.”

- 2.4 Further advice on the assessment of noise from different types of sources is provided in Appendix B of TAN11, where paragraph B17 states the following regarding industrial and commercial developments:

“The likelihood of complaints about noise from industrial development can be assessed, where the Standard is appropriate, using guidance in BS 4142:1990.

...

In addition, general guidance on acceptable noise levels within buildings can be found in BS 8233:1987.”

- 2.5 It should be noted that both of the British Standards referenced in paragraph B17 of TAN11 have been superseded, with the current version of BS 4142 (BS 4142:2014+A1:2019) no longer assessing the likelihood of complaints, but rather the likelihood of adverse and significant adverse effects.

Local and Regional Policy

- 2.6 The site is located within the administrative area of Bridgend County Borough Council (BCBC). The local policies from BCBC that are relevant to noise and vibration are presented below.

Bridgend Local Development Plan 2006-2021

- 2.7 The Bridgend Local Development Plan was adopted in September 2013.
- 2.8 Policy ENV7 refers to Natural Resource Protection and Public Health and states the following:

“Development proposals will only be permitted where it can be demonstrated that they would not cause a new, or exacerbate an existing, unacceptable risk of harm to health, biodiversity and/or local amenity due to:

...

2) Noise pollution;

...

Development in areas currently subject to the above will need to demonstrate mitigation measures to reduce the risk of harm to public health, biodiversity and/or local amenity to an acceptable level.”

- 2.9 Policy ENV16 refers to Commercial and Industrial Waste and states the following:

“Proposals for the treatment, processing and distribution of commercial and industrial waste such as:

- i) Materials Recycling Facilities (MRF);*
- ii) Mechanical Biological Treatment facilities (MBT);*
- iii) In-vessel/anaerobic digestion composting facilities,*

Will be directed to sites outlined in policy SP7.”

- 2.10 The proposed development falls within category i), and Policy SP7 identifies the site as a favoured site for new waste treatment facilities.

Standards and Guidance

BS 4142:2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'*

- 2.11 BS 4142:2014+A1:2019 is used to rate and assess sound of an industrial nature including but not limited to assessing sound from proposed, new, modified or additional sources of industrial sound. It contains guidance on the monitoring and assessment of industrial and commercial sound sources (including fixed installations comprising mechanical and electrical plant and equipment) affecting sensitive receptors.
- 2.12 The methodology relies on comparing the operational rating level, $L_{Ar,Tr}$, with the background sound level, $L_{A90,T}$ (i.e. the level that would be present without the development) over a representative time period. BS 4142:2014+A1:2019 provides guidance on the measurement of background sound, the determination of specific sound and calculation of the rating level.
- 2.13 Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. A character correction should be added to the specific sound level to obtain the rating level, where such features are present at the assessment location. This can be approached in three ways however the subjective method is considered appropriate for this assessment. This states that the specific sound level should be corrected if a tone, impulse or other characteristic occurs, or is expected to be present for new sound sources.
- 2.14 BS 4142:2014+A1:2019 assessment methodology also states that:
- Typically, the higher the rating level is above the background sound level the greater the magnitude of impact;
 - A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
 - A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
- 2.15 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.

3 Assessment Approach

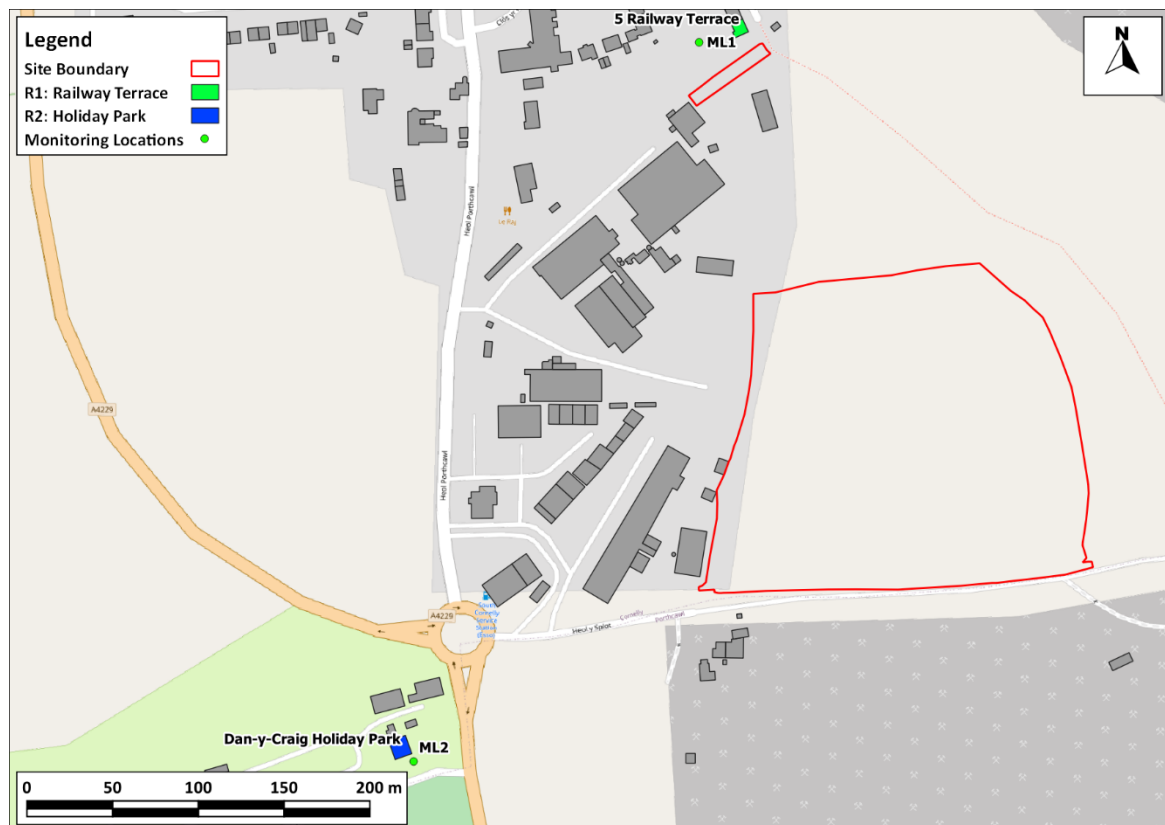
Background Sound Survey

- 3.1 A background sound survey was conducted between 25 August 2020 and 01 September 2020. The survey was designed to capture noise levels at the closest NSR during the proposed operational periods of the proposed development (07:00 – 19:00 Monday – Friday, 07:00 – 13:00 Saturday).
- 3.2 **Table 1** lists the identified closest NSR and associated monitoring locations. A meteorological monitoring station was also deployed to monitor weather conditions throughout the duration of the survey.

Table 1: Monitoring Locations

| Ref | Receptor | Monitoring Location |
|---|--|--|
| ML1 | 5 Railway Terrace | At the rear garden of 5 Railway Terrace |
| ML2 | Residential dwelling at Pan y Craig Caravan Park | At the front garden of the dwelling at Pan y Craig Caravan Park* |
| *It was confirmed with the resident that they use the front garden as their amenity space rather than the area to the rear of the dwelling. | | |

- 3.3 The monitoring locations are also presented in **Figure 2** with the site boundary also presented. The monitoring locations were chosen to provide a good understanding of the acoustic environment at the NSR.

Figure 2: Monitoring Locations

- 3.4 The calibration levels of the sound level meters (SLM) were checked before and after each measurement with no significant drift recorded. Windshields were fitted to the microphones to minimise the effects of any wind induced sound.
- 3.5 Details of the monitoring instrumentation (model/serial numbers and calibration details) are available upon request. All instrumentation was configured to report the environmental parameters L_{Aeq} , L_{A10} , L_{A90} , and L_{Amax} in one-third octave bands, and capture audio.
- 3.6 All measurements were conducted, where possible in accordance with BS 4142:2014+A1:2019 and BS 7445-1:2003 'Description and measurement of environmental noise. Guide to quantities and procedures' (BS 7445, 2003). Photos of the monitoring locations, taken whilst on site, can be found and referenced in **Appendix A2**.

Meteorological Conditions During the Survey

- 3.7 Meteorological data has been extracted from a local met station available online. Periods of adverse weather have been removed from the data analysis as they have been highlighted as being unrepresentative. The remaining monitoring data covers a total of approximately 52 hours and 30 minutes, which is considered sufficient to provide a robust understanding of baseline conditions at the NSR.

Survey Uncertainty

3.8 BS 4142:2014+A1:2019 requires the consideration of the uncertainty with measured values. Measurement uncertainty was minimised for the background sound measurement due to:

- The measurement location was representative of the external amenity areas of the dwellings;
- the measurement position was located away from reflecting surfaces and leafy vegetation as far as practicable;
- the measurements were undertaken using the minimum logging period suggested in BS 4142:2014+A1:2019;
- the measurements were taken across the proposed operational periods of the proposed development;
- the measurements were undertaken under suitable weather conditions as described in Section 6.4 of BS 4142:2014+A1:2019;
- the measurements were rounded to the nearest whole number before calculation of averages, totals, etc; and
- the instrumentation is suitable according to Section 5 of BS 4142:2014+A1:2019.

4 Survey Results

Measured Background Sound Levels

- 4.1 A summary of the levels captured during the operational hours of the proposed development is shown in **Table 2** (rounded to the nearest whole decibel).

Table 2: Summary of Measured Sound Levels

| Location | dB L _{Aeq,T} | dB L _{A90,15 min} (Mean) | dB L _{A90,15 min} (Mode) | dB L _{Amax} |
|--|-----------------------|--------------------------------------|--------------------------------------|----------------------|
| ML1 Operational Hours (07:00-19:00 Mon – Fri, 08:00-13:00 Sat, Sun) | 50 | 44 | 49 | 90 |
| ML2 Operational Hours (07:00-19:00 Mon – Fri, 08:00-13:00 Sat, Sun) | 58 | 53 | 54 | 84 |

- 4.2 A summary of the measured sound levels for the duration of the survey period is presented in **Appendix A3** as time-history charts.

Survey Observations

- 4.3 Observations of the noise climate at the survey locations are summarised in **Table 3**.

Table 3: Noise survey observations at each survey location

| Location Ref | Observations |
|--------------|--|
| ML1 | The sound environment was characterised by industrial sound from the nearby South Cornelly Industrial Estate. This included plant hum, impulsive sounds (such as hammering and moving plant bucket shovels hitting the ground) and plant hazard beeping. Distant road traffic was also audible, and at times it was difficult to distinguish between the sound of distant road traffic and general industrial hum. Birdsong was audible. |
| ML2 | The sound environment was characterised by road traffic noise from the nearby A4229/Porthcawl Road. No sound from the industrial estate was audible, even during periods of traffic calm. |

- 4.4 The main source of sound at ML1 - 5 Railway Terrace was from a mixture of industrial and distant road traffic sources. Industrial activity was frequently audible and included a mixture of impulsive sounds, general plant hum, moving plant and vehicle hazard alarms.
- 4.5 The main source of sound at ML2 - Dan-y-Craig Caravan Park was from road traffic, with a high volume of traffic noted to pass the property on the adjacent A4229. No industrial activity was audible from the South Cornelly Industrial Estate.

- 4.6 In order to determine the representative background sound level for use in the assessment, consideration has been given towards the mean and modal $L_{A90,15min}$ measured during the site operational hours as well as the distribution of background sound levels (as shown in **Appendix A3**) has been undertaken. The measured sound levels during the proposed operational hours (between 07:00 – 19:00 Monday to Friday and 08:00 – 13:00 Saturday to Sunday) have been used to represent the background sound level at the NSR.
- 4.7 With respect to the determination of background sound levels at locations characterised by industrial sounds which are not associated with the proposed development, BS 4142:2014+A1:2019 states:
- “Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.”*
- 4.8 It is therefore considered reasonable to include sound from the existing industrial sources present at ML1 - 5 Railway Terrace when determining a representative background sound level.
- 4.9 At location ML1 - 5 Railway Terrace, **Table 3** shows that the modal (most occurring) $L_{A90,15min}$ is 49 dB, which is 5 dB higher than the mean $L_{A90,15min}$. However, a review of the distribution of background sound levels (**Figure A3.2** in **Appendix A3**) indicates that there is also a large number of occurrences of measured 43 and 44 dB $L_{A90,15min}$. On this basis, it is considered appropriate to adopt the mean measured $L_{A90,15min}$ (44 dB).
- 4.10 At location ML2 - Dan-y-Craig Caravan Park, **Table 3** shows a marginal (1 dB) difference between the modal and mean $L_{A90,15min}$. A review of the distribution of background sound levels (**Figure A3.4** of **Appendix A3**) indicates a normal distribution of measured background sound levels, with 54 dB $L_{A90,15min}$ being the most occurring. On this basis, it is considered appropriate to adopt the modal measured $L_{A90,15min}$ (54 dB).
- 4.11 The adopted background sound levels for the assessment are summarised in **Table 4**.

Table 4: Background Sound Levels Adopted for the Assessment

| Period | Location | dB $L_{A90,15min}$ |
|--|-----------------------------------|--------------------|
| Operational Hours (07:00-19:00 Mon – Fri, 08:00-13:00 Sat, Sun) | ML1 (5 Railway terrace) | 44 |
| Operational Hours (07:00-19:00 Mon – Fri, 08:00-13:00 Sat, Sun) | ML2 (Dan-y-Craig Caravan Park) | 54 |

5 Modelling and Assessment

Plant Sound Emissions

- 5.1 Plant sound emission data has been provided by the client from a combination of data sources. These have been used to construct a noise model of the proposed development. Full details of the plant sound emission data is presented in **Appendix A4**.
- 5.2 It has not been possible to obtain octave band sound source data for most of the proposed plant, therefore the modelling has been calibrated to the stated broadband sound power levels.
- 5.3 Should plant emission values and/or operations of the proposed development be confirmed to vary from those listed in **Appendix A4**, or if more detailed octave band sound source emission data become available and/or the site layout changes from those currently proposed, then an updated noise assessment may be required taking the updated sound source information into account.

Noise Modelling

- 5.4 The propagation of sound levels arising from the operation of the proposed development has been determined through noise modelling. Noise modelling has been undertaken using Stapelfeldt's LimA® computational noise modelling software (v2020), which accounts for variances in propagation due to barrier and ground effects, such as those due to existing buildings or over water.

Terrain Model

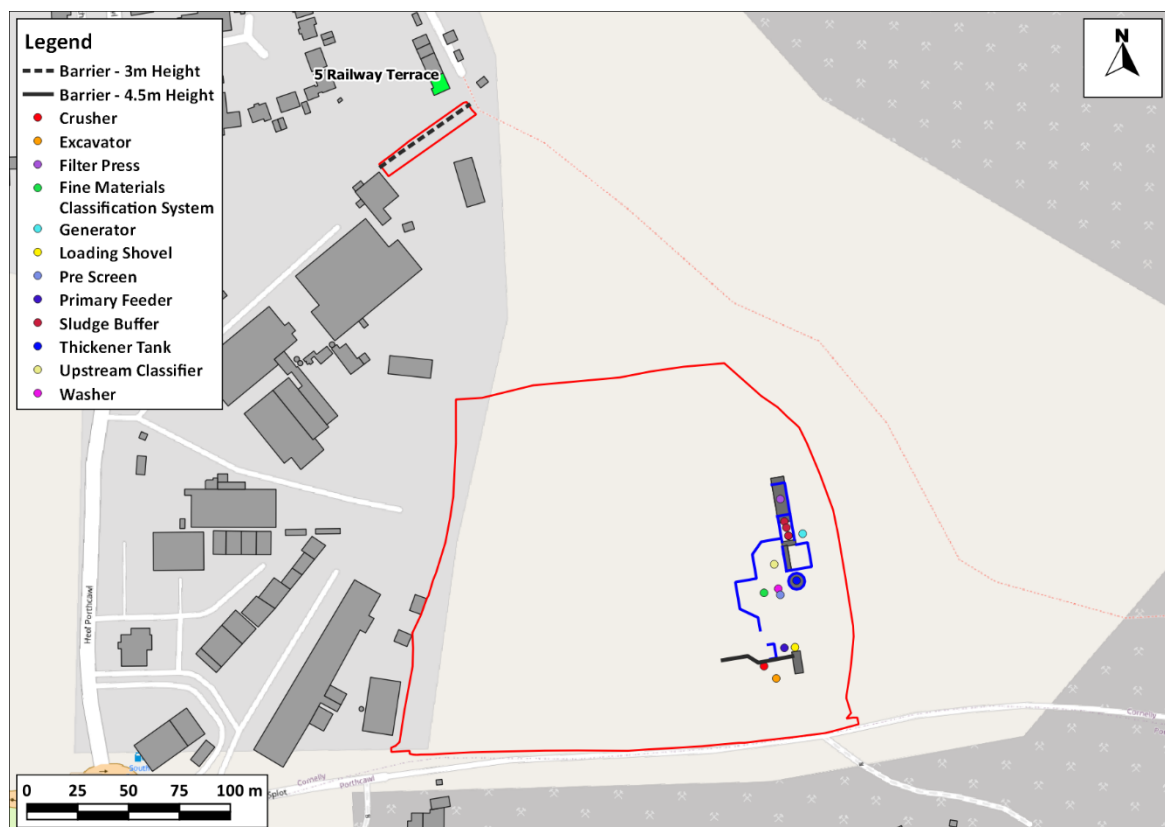
- 5.5 Ground elevations of the existing terrain and building heights have been determined through analysis of LiDAR Digital Terrain Model (DTM) and Digital Surface Model (DSM) data, so that they are represented in the model. LiDAR DTM data describes ground terrain elevations at 1m spatial resolution. LiDAR DSM data describes ground terrain elevations with the inclusion of the heights of buildings, also at 1m spatial resolution.
- 5.6 Ground elevations within the site boundary have been determined through data provided by the client.

Modelling Assumptions

- 5.7 The calculation method given in ISO 9613 '*Acoustics — Attenuation of sound during propagation outdoors*' Parts 1 and 2 have been used to predict the sound propagation in the model. The calculation results are considered to be worst case as they assume downwind propagation, which in reality would not occur at all times due to changes in wind direction. Predictions assume mixed ground attenuation ($G=0.5$). Receiver heights in the model have been set across the façades of the NSR at 1.5m above ground which represents ground floor level. For the purposes of the assessment, and as a worst-case, the highest predicted sound level at the façades of each NSR has been applied to the assessment.

- 5.8 The proposed development has inherent mitigation measures in the form of noise barriers in order to minimise sound levels at 5 Railway Terrace, which is at highest risk of adverse effects due to relatively low background sound levels.
- 5.9 For the purposes of this assessment, a 4.5m barrier adjacent to the primary feeder to mitigate sound from the crusher and excavator, and an additional 3m barrier to the north of the site, close to 5 Railway Terrace, has been included to indicate the potential in sound reductions achievable. The precise extents and heights of the barrier will be determined at the detailed design stage.
- 5.10 The location of the noise barriers are shown in **Figure 3**. The construction of the noise barriers should ensure that there are no gaps between each adjacent panel or along the ground, and be of a surface density of at least 10 kg/m³.

Figure 3: Location of Barriers



- 5.11 The 3m barrier to the north will be visually screened by the existing treeline between the barrier and 5 Railway Terrace. It will also provide additional noise reduction benefits for other noise producing activities at the site to the immediate south of the NSR.

Modelling Scenarios

- 5.12 A total of four scenarios have been considered in the assessment, due to the location of the NSR in relation to the proposed development and also taking into account that the crusher will only be in operation for 28 days of the year in total.
- 5.13 The assessment scenarios are described in **Table 5** below.

Table 5: Assessment Scenario

| Scenario | Description | Crusher |
|----------|---|---------|
| 1 | Worst-case scenario for the northern NSR (5 Railway Terrace), whereby it is assumed that Tipper Lorries and the Loading Shovel in the product stockpile area will be operating close to the northern site boundary, therefore closest to 5 Railway Terrace. The crusher is assumed to be operational. | On |
| 2 | Worst-case scenario for the northern NSR (5 Railway Terrace), whereby it is assumed that Tipper Lorries and the Loading Shovel in the product stockpile area will be operating close to the northern site boundary, therefore closest to 5 Railway Terrace. The crusher is assumed to not be operational. | Off |
| 3 | Worst-case scenario for the western NSR (Dan-y-Craig Caravan Park), whereby it is assumed that Tipper Lorries and the Loading Shovel in the product stockpile area will be operating close to the western site boundary, therefore closest to Dan-y-Craig Caravan Park. The crusher is assumed to be operational. | On |
| 4 | Worst-case scenario for the western NSR (Dan-y-Craig Caravan Park), whereby it is assumed that Tipper Lorries and the Loading Shovel in the product stockpile area will be operating close to the western site boundary, therefore closest to Dan-y-Craig Caravan Park. The crusher is assumed to not be operational. | Off |

BS 4142:2014+A1:2019 Procedure

- 5.14 The assessment is performed by comparing the rating level of the sound source(s), $L_{A,r,Tr}$, against the background sound level, $L_{A90,T}$. Guidance is provided on how to monitor and determine the background sound level, specific sound level and rating level.
- 5.15 Where there are certain acoustic features of the specific sound level, L_s that would likely increase the significance of impact, then an appropriate character correction is added to the specific sound level, L_s . This is referred to as the rating level $L_{A,r,Tr}$.

Character Correction Considerations

Tonality

- 5.16 A tonal correction between 0 and +6 dB can be applied for sounds that range from not tonal to prominently tonal. Several methodologies are presented in BS 4142:2014 in order to determine the appropriate correction to be applied. **Table 6** presents the subjective assessment method corrections for tonal sounds.

Table 6: Subjective Method – Rating Level Corrections for Tonal Sounds

| Subjective Assessment of Sound at the Receptor | Correction |
|---|------------|
| The tone is just perceptible at the receptor | +2 dB |
| The tone is clearly perceptible at the receptor | +4 dB |
| The tone is highly perceptible at the receptor | +6 dB |

- 5.17 It is considered unlikely that the proposed development will contain any distinguishable tones therefore no correction has been considered appropriate to be applied to this assessment.

Impulsivity

- 5.18 An impulsivity correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. **Table 7** presents the subjective method corrections for impulsive sounds.

Table 7: Subjective Method – Rating Level Corrections for Impulsive Sounds

| Subjective Assessment of Sound at the Receptor | Correction |
|--|------------|
| Impulsivity is just perceptible at the receptor | +3 dB |
| Impulsivity is clearly perceptible at the receptor | +6 dB |
| Impulsivity is highly perceptible at the receptor | +9 dB |

- 5.19 It is considered possible that sound from the proposed development will contain impulsive characteristics audible at the NSR.
- 5.20 With respect to 5 Railway Terrace, the ambient acoustic environment is characterised by frequent existing impulsive sounds from operations at closer proximity in comparison to the proposed development. It is therefore considered likely that any impulsive sound from the proposed development will not be as noticeable in the context of the existing acoustic environment. A penalty of 3 dB is therefore applied.
- 5.21 With respect to Dan-y-Craig Caravan Park, the ambient acoustic environment is characterised by high levels of continuous road traffic noise, and industrial operations from the South Cornelly Trading Estate was not audible. It is therefore considered likely that any impulsive sound from the proposed development will only be noticeable during periods of traffic calm. A correction of 3 dB is therefore applied.

Intermittency and Other Sound Characteristics

- 5.22 Where the specific sound level features characteristics that are neither tonal nor impulsive, though otherwise are of an intermittent character, a correction of 3 dB can be applied. Assuming that the proposed plant is kept well maintained and serviced regularly, no correction is considered appropriate for other sound characteristics.

Reference Time Periods

- 5.23 The appropriate reference time interval for assessing a sound source is dependent upon when it operates i.e. during the daytime or night-time. BS 4142:2014+A1:2019 determines the reference time interval as 1 hour during the day and 15 minutes at night. As the proposed plant and machinery is not proposed to operate during night hours (23:00 – 07:00), only a daytime assessment has been undertaken.

Background Sound Level

- 5.24 The background sound level, L_{A90} , as required by the BS 4142:2014+A1:2019 assessment, is taken as the $L_{A90, T}$ from the data captured at the monitoring locations.

Specific Sound Level

- 5.25 Predicted $L_{Aeq,1hr}$ sound levels at the NSRs at a height of 1.5m above ground level have been used to represent the specific sound levels.
- 5.26 The source sound levels presented in **Appendix A4** have been incorporated into the noise model, with each source calibrated to the relevant level and number of operations/durations within a typical hour.

Assessment of Impacts

- 5.27 As detailed in **Section 2** of this report, the greater the rating level is above the background sound level, the greater the significance of sound impact. The noise model has been used to determine the specific sound levels for daytime operational periods at the NSR for all assessment scenarios.
- 5.28 **Table 8** presents a summary of the BS 4142:2014+A1:2019 assessment for all assessment scenarios listed in **Table 5**. Full details of the assessment are presented in **Appendix A5**.

Table 8: BS 4142:2014+A1:2019 Assessment Summary

| Scenario | NSR | Difference (Rating Level – Background Sound Level) | BS 4142:2014+A1:2019 Assessment Outcome |
|----------|--------------------------|--|---|
| 1 | 5 Railway Terrace | -1 | Low Impact Indicated |
| | Dan-y-Craig Caravan Park | -4 | Low Impact Indicated |
| 2 | 5 Railway Terrace | -3 | Low Impact Indicated |
| | Dan-y-Craig Caravan Park | -10 | Low Impact Indicated |
| 3 | 5 Railway Terrace | -2 | Low Impact Indicated |
| | Dan-y-Craig Caravan Park | -4 | Low Impact Indicated |
| 4 | 5 Railway Terrace | -4 | Low Impact Indicated |
| | Dan-y-Craig Caravan Park | -10 | Low Impact Indicated |

- 5.29 **Table 8** shows that under all scenarios, and at both NSR, the assessment outcome indicates a ‘**Low Impact**’. The Scenarios in which the crusher is not operational (Scenario 2 and Scenario 4) achieve the largest favourable differences between the rating level and background sound level at the NSR.
- 5.30 Comparison of the scenarios whereby the Tipper Lorry and Loading Shovel is operating close to the northern boundary against those where they are operating close to the western boundary, (i.e. Scenario 1 vs Scenario 3 or Scenario 2 vs Scenario 4) indicates that the location of the plant within the product stockpile area will have a negligible influence on the levels at the NSR.
- 5.31 For context, and as part of a cumulative assessment, an assessment of the likely change in ambient sound levels as a result of the operation of the proposed development has been undertaken.

Assessment of Change in Ambient Sound Levels

- 5.32 **Table 9** presents the assessment of change in ambient sound levels. The existing ambient sound level has been adopted from the measured ambient sound level captured during the proposed operational hours of the proposed development, (as shown in **Table 2**).
- 5.33 The measured existing ambient sound level has been combined with the predicted specific sound level by means of logarithmic addition to determine the resultant ambient sound level. The change in sound level is then determined by comparing the resultant ambient sound level with the existing ambient sound level.

Table 9: Assessment of Change in Ambient Sound Levels

| Scenario | NSR | Existing Ambient Sound Level dB L _{Aeq,T} | Predicted Specific Sound Level dB L _{Aeq,T} | Resultant Ambient Sound Level dB L _{Aeq,T} | Change in Sound Level dB |
|----------|--------------------------|---|---|--|-----------------------------|
| 1 | 5 Railway Terrace | 50 | 40 | 50 | 0 |
| | Dan-y-Craig Caravan Park | 58 | 47 | 58 | 0 |
| 2 | 5 Railway Terrace | 50 | 38 | 50 | 0 |
| | Dan-y-Craig Caravan Park | 58 | 41 | 58 | 0 |
| 3 | 5 Railway Terrace | 50 | 39 | 50 | 0 |
| | Dan-y-Craig Caravan Park | 58 | 47 | 58 | 0 |
| 4 | 5 Railway Terrace | 50 | 37 | 50 | 0 |
| | Dan-y-Craig Caravan Park | 58 | 41 | 58 | 0 |

- 5.34 **Table 9** shows that the operation of the proposed development is unlikely to cause an increase to the existing ambient sound level at either NSR for all assessment scenarios.
- 5.35 It is considered unlikely that the operation of the proposed development will result in adverse effects at the NSR.

6 Conclusion

- 6.1 A sound assessment has been undertaken to determine the likely operational sound impact from a proposed Aggregate Recycling facility at land adjacent to Heol-y-Splot, Bridgend upon two noise sensitive receptors (NSR): 5 Railway Terrace, situated approximately 150m north of the proposed development site, and Dan-y-Craig Caravan Park, situated approximately 195m west of the proposed development site.
- 6.2 Sound monitoring was undertaken at locations in the vicinity of the closest noise sensitive receptors (NSR), and the measured levels used to inform a BS 4142:2014+A1:2019 assessment.
- 6.3 A sound propagation model of the proposed plant, calibrated to sound source emission data, was constructed using Stapelfeldt's LimA® computational sound modelling suite (v2020) to enable prediction of the specific sound and rating level at the NSR.
- 6.4 Initial results from the modelling indicated that sound levels generated from the proposed development would result in adverse impacts at 5 Railway Terrace, and further noise modelling was undertaken that incorporated noise barriers inherent in the masterplan design.
- 6.5 A total of four assessment scenarios have been considered, including a worst-case scenario for both NSR (based upon the location of the plant operating within the product stockpile area) and whether the crusher will be in operation or not (the crusher will only operate for a total of 28 days of the year).
- 6.6 The BS 4142:2014+A1:2019 assessment outcome is that the rating level from the proposed development is likely to have a '**Low Impact**' for all assessment scenarios.
- 6.7 For context, an additional assessment of the likely change in ambient sound levels as a result of the operation of the proposed development has also been undertaken. The assessment demonstrated that the operation of the proposed development is unlikely to cause an increase to the existing ambient sound level at the NSR.

7 Glossary

| | |
|--|---|
| dB | Decibel. The logarithmically scaled measurement unit of sound. |
| A-weighting | Frequency weighting applied to measured sound in order to account for the relative loudness perceived by the human ear. |
| $L_{Aeq,T}$ | A-weighted equivalent continuous sound level over a given time period. It is the sound level of a steady sound that has the same energy as a fluctuating sound over the same time period. |
| $L_{A10,T}$ | The A-weighted sound level exceeded for 10% of the measurement period. It is widely used as a descriptor of road traffic noise. |
| $L_{A90,T}$ | The A-weighted sound level exceeded for 90% of the measurement period. Often referred to as the background sound level. |
| L_{Amax} | The A-weighted maximum recorded noise level during a measurement period. |
| Ambient sound level, $L_a = L_{Aeq,T}$ | The A-weighted equivalent continuous sound level of the totally encompassing sound for a given situation and time interval, T. |
| Specific sound level, $L_s = L_{Aeq,Tr}$ | The A-weighted equivalent continuous sound pressure level produced by the specific sound source at the reference location over a reference time interval, T. |
| Rating level, $L_{Ar,Tr}$ | The specific sound level plus any adjustment for the characteristic features of the sound. |

8 Appendices

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A1 Noise Monitoring Instrumentation Details

A1.1 The details of the noise monitoring equipment used for the baseline measurements at ML1 and ML2 are presented in **Table A1.1**.

Table A1.1: Monitoring Equipment Details

| Description | Location | Type | Model | Serial | Last Laboratory Calibration |
|---------------------|----------|---------|------------|----------|-----------------------------|
| Sound Level Meter | ML1 | Class 1 | Rion NL-52 | 1176433 | 03/08/2020 |
| Sound Level Meter | ML2 | Class 1 | Rion NL-52 | 687044 | 24/02/2020 |
| Acoustic Calibrator | N/A | Class 1 | Rion NC-75 | 35281145 | 24/02/2020 |

A1.2 Calibration certificates for all monitoring equipment can be supplied on request.

A2 Site Photographs

Figure A2.1: ML1 – 5 Railway Terrace View 1



REDACTED AT THE REQUEST OF THE PROPERTY OWNER

Figure A2.2: ML1 – 5 Railway Terrace View 2

REDACTED AT THE REQUEST OF THE PROPERTY OWNER

Figure A2.3: ML2 – Dan-y-Craig Caravan Park View 1



Figure A2.4: ML2 – Dan-y-Craig Caravan Park View 2



A3 Measured Sound Levels

Figure A3.1: ML1 – 5 Railway Terrace Time History Chart

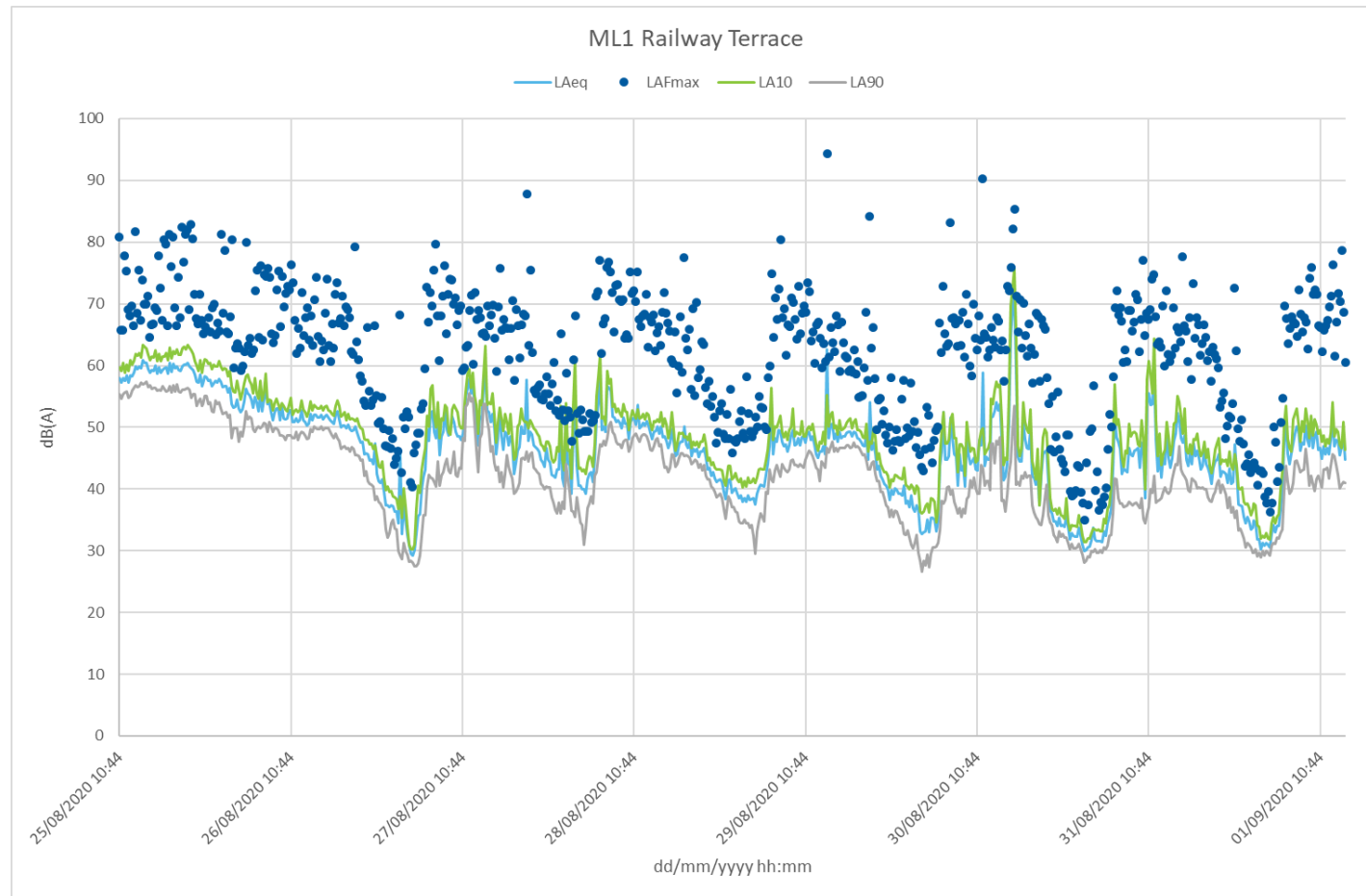


Figure A3.2: ML1 – 5 Railway Terrace Background Sound Level Distribution

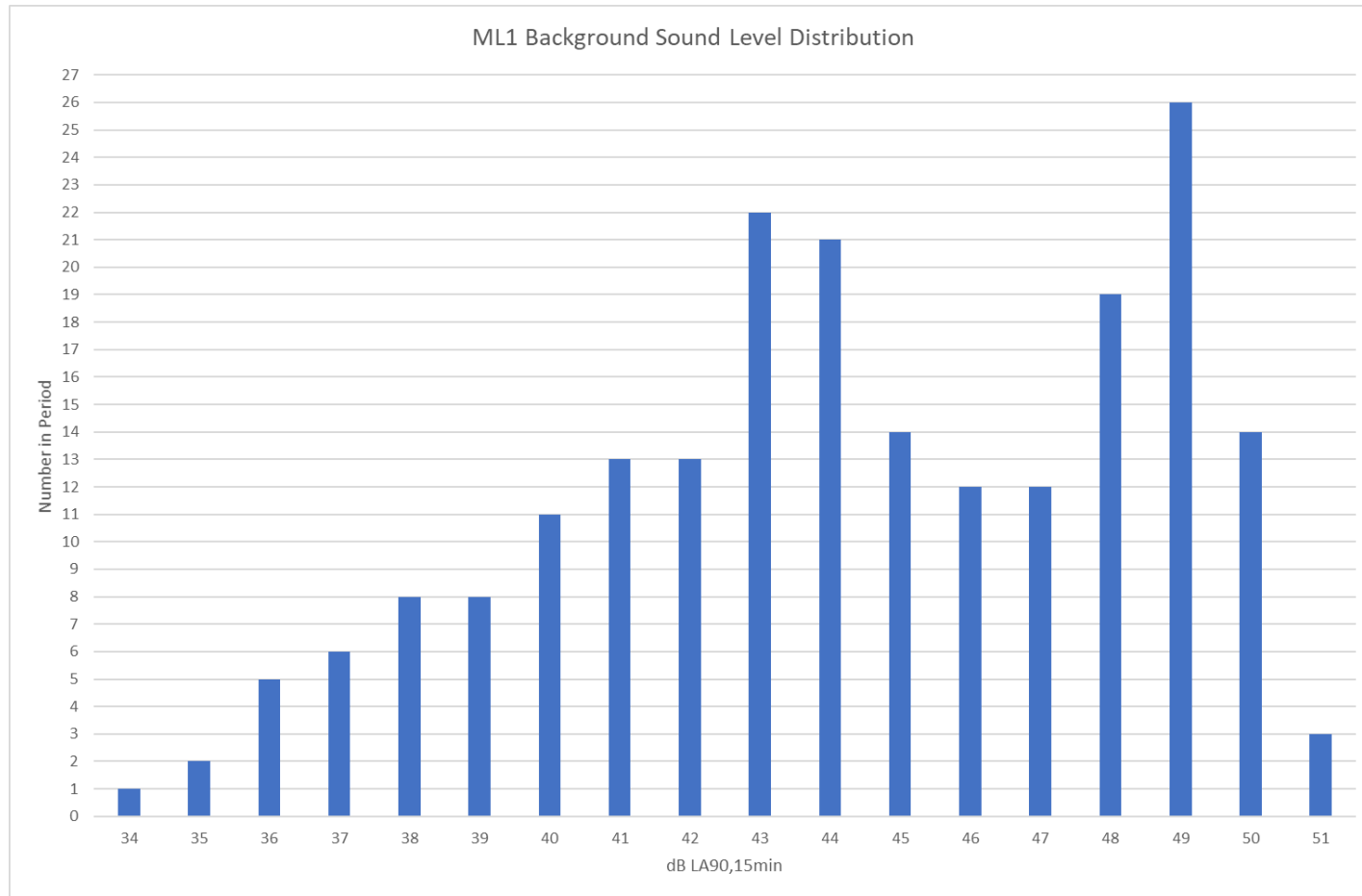


Figure A3.3: ML2 – Dan-y-Craig Caravan Park Time History Chart

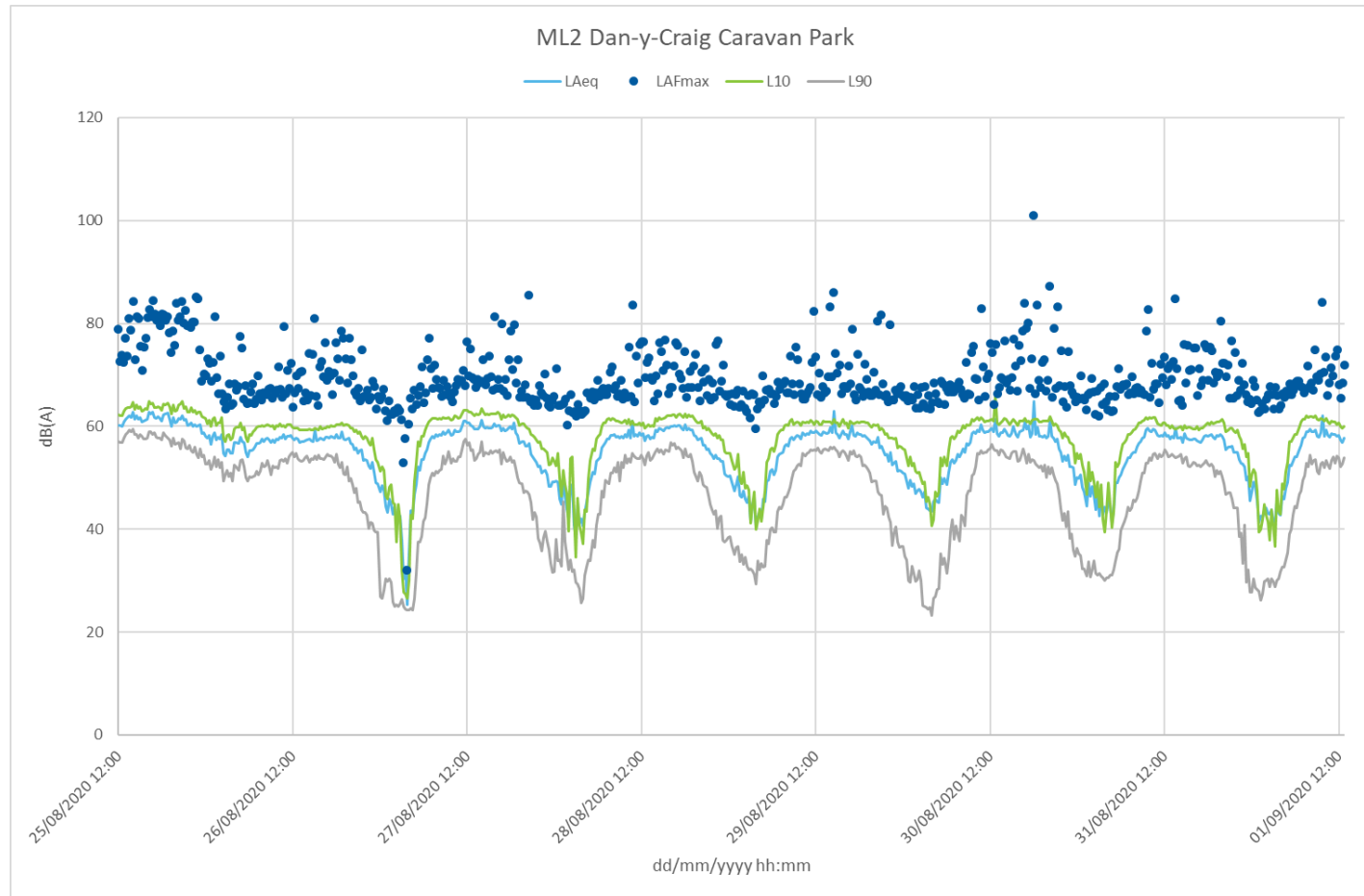
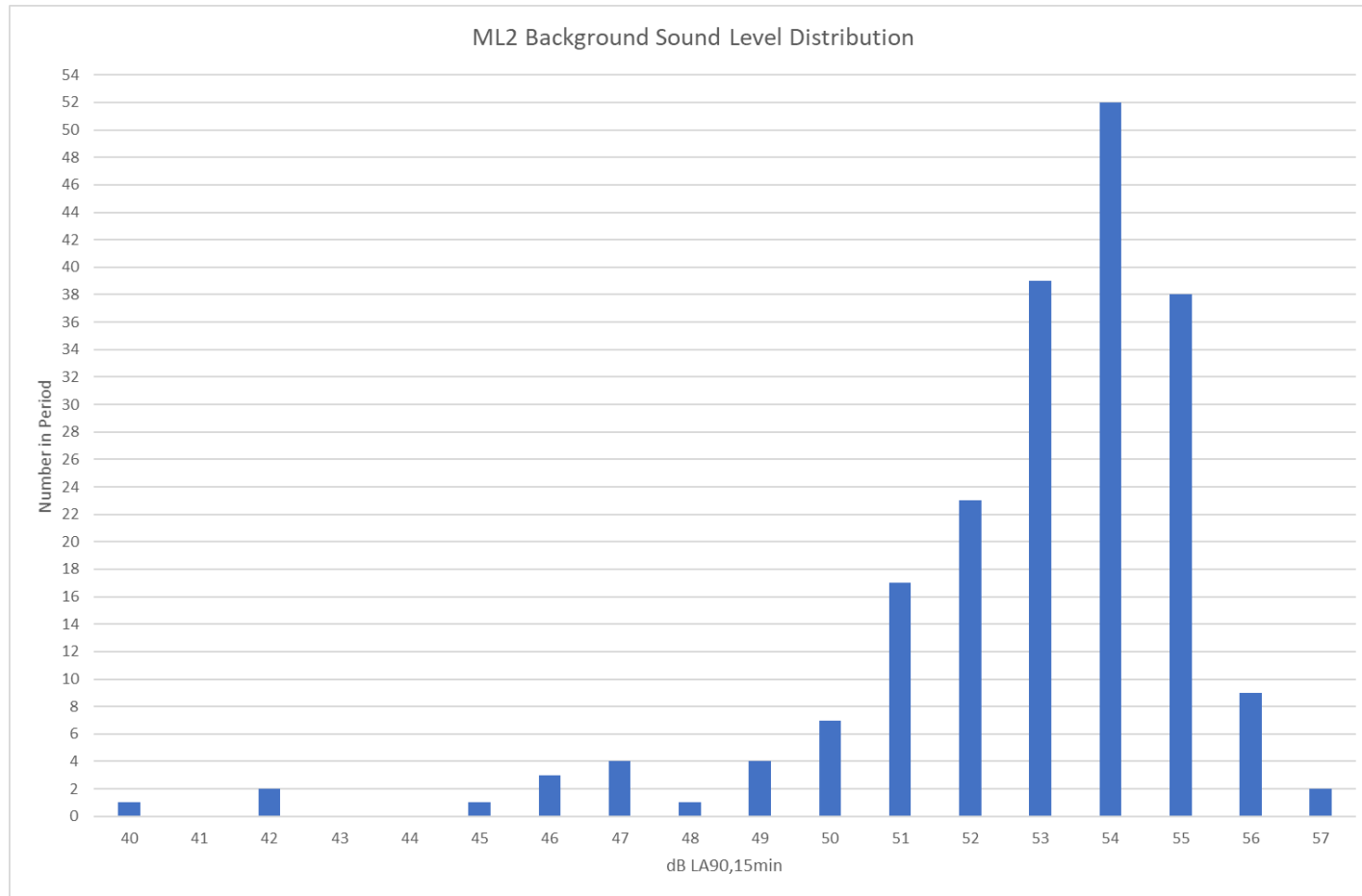


Figure A3.4: ML2 – Dan-y-Craig Caravan Park Background Sound Level Distribution



A4 Plant Sound Emission Data

Table A4.1: Plant Sound Emission Data

| Plant Item | Sound Power Level (dB L _{WA}) | Data source | Source Height (relative to local ground) | Number of Movements / Operations per Hour and Plant Speeds |
|---|--|-------------------------------------|---|--|
| Generator | | | | |
| Generator QAS500 | 99 | Atlas Copco manufacturer data sheet | 2.3m | Continuous Operation |
| Handling Equipment | | | | |
| Doosan DX225LC-3 Excavator | 107 | Doosan manufacturer data | 1.5m | Continuous Operation |
| Crusher | 112 | BS 5228 Table C1 ref 15 | 3.4m | Continuous Operation |
| Load Shovel Loading | 103 | Doosan manufacturer's data sheet | 1m | 3 operations per hour, 7 minutes per load |
| Loading Shovel Unloading | 103 | Doosan manufacturer's data sheet | 6.75m | 13 operations per hour, 20 seconds per tip |
| Loading Shovel Unloading | 103 | Doosan manufacturer's data sheet | 1m | 9 operations per hour, 20 seconds per tip |
| Tipper Unloading | 113 | BS 5228 Table D.3 ref 112 | 1m | 9 operations per hour, 20 seconds per tip |
| Tipper Loading | 113 | BS 5228 Table D.3 ref 112 | 1m | 3 operations per hour, 2 minutes per load |
| Loading Shovel Travelling from Inert Waste to Primary Feeder | 99 | BS 5228 Table C.4 ref 13 | 1.5m | 13 movements per hour, 5kph speed |
| Loading Shovel Travelling from Recycling Plant to Product Stockpile | 99 | BS 5228 Table C.4 ref 13 | 0.5m | 10 movements per hour, 8kph speed |

| Plant Item | Sound Power Level (dB L _{WA}) | Data source | Source Height (relative to local ground) | Number of Movements / Operations per Hour and Plant Speeds |
|---|--|---|---|--|
| 32t Tipper Travelling Out | 105 | BS 5228 Table D.3 ref 59 | 1m | 6 movements per hour, 8kph speed |
| 32t Tipper Travelling In | 105 | BS 5228 Table D.3 ref 59 | 1m | 6 movements per hour, 8kph speed |
| 32t Tipper Travelling to Waste | 105 | BS 5228 Table D.3 ref 59 | 1m | 6 movements per hour, 8kph speed |
| 32t Tipper Travelling to Stock | 105 | BS 5228 Table D.3 ref 59 | 1m | 6 movements per hour, 8kph speed |
| Aggregates Recycling Plant | | | | |
| Primary Feeder | 85 | CDE manufacturer data sheet of identical plant | 6.3m | Continuous Operation |
| Feed Conveyor | 71 | CDE manufacturer data sheet of identical plant | 1.2m to 9.0m | Continuous Operation |
| Pre-Screen | 82 | CDE manufacturer data sheet of identical plant | 7.2m | Continuous Operation |
| Washer | 76 | CDE manufacturer data sheet of identical plant | 5.5m | Continuous Operation |
| Upstream Classifier | 80 | CDE manufacturer data sheet of identical plant | 3.5m | Continuous Operation |
| Fine Materials Classification System | 74 | CDE manufacturer data sheet of identical plant | 6.5m | Continuous Operation |
| Stockpile Conveyor (x5) | 71 | CDE manufacturer data sheet of identical plant | 1.5m to 6.4m | Continuous Operation |
| Thickener Tank | 77 | CDE manufacturer data sheet of identical plant | 6.6m | Continuous Operation |

| Plant Item | Sound Power Level (dB L _{WA}) | Data source | Source Height (relative to local ground) | Number of Movements / Operations per Hour and Plant Speeds |
|-------------------------------------|--|---|---|--|
| Sludge Buffer Tank Agitator (x3) | 77 | Sludge Buffer Tank motor is similar to that of thickener tank, therefore same emission assumed | 7.2m | Continuous Operation |
| Filter Press | 70 | CDE manufacturer data sheet of identical plant | 9m | Continuous Operation |

A5 BS 4142:2014+A1:2019 Assessment Details

Scenario 1 (Worst-Case for 5 Railway Terrace with Crusher Operating)

A5.1 **Table A5.1** details the Scenario 1 BS 4142:2014+A1:2019 assessment for the daytime operational hours at the NSR.

Table A5.1: Scenario 1 Assessment of Impacts

| Description | 5 Railway Terrace | Dan-y-Craig Caravan Park |
|--|----------------------|--------------------------|
| Predicted Specific Sound Level, dB $L_s = L_{Aeq,T}$ | 40 | 47 |
| Character Correction (Impulsivity) | +3 | +3 |
| Rating Level, dB $L_{A,r,Tr}$ | 43 | 50 |
| Background Sound Level, dB L_{A90} | 44 | 54 |
| Difference (Rating Level – Background Sound Level) | -1 | -4 |
| BS 4142:2014+A1:2019 Outcome | Low Impact Indicated | Low Impact Indicated |

A5.2 **Table A5.1** shows that, under Scenario 1, the assessment outcome indicates a ‘Low Impact’ at both NSR.

Scenario 2 (Worst-Case for 5 Railway Terrace with Crusher Not Operating)

A5.3 **Table A5.2** details the Scenario 2 BS 4142:2014+A1:2019 assessment for the daytime operational hours at the NSR.

Table A5.2: Scenario 2 Assessment of Impacts

| Description | 5 Railway Terrace | Dan-y-Craig Caravan Park |
|--|----------------------|--------------------------|
| Predicted Specific Sound Level, dB $L_s = L_{Aeq,T}$ | 38 | 41 |
| Character Correction (Impulsivity) | +3 | +3 |
| Rating Level, dB $L_{A,r,Tr}$ | 41 | 44 |
| Background Sound Level, dB L_{A90} | 44 | 54 |
| Difference (Rating Level – Background Sound Level) | -3 | -10 |
| BS 4142:2014+A1:2019 Outcome | Low Impact Indicated | Low Impact Indicated |

A5.4 **Table A5.2** shows that, under Scenario 2, the assessment outcome indicates a 'Low Impact' at both NSR.

Scenario 3 (Worst-Case for Dan-y-Craig Caravan Park with Crusher Operating)

A5.5 **Table A5.3** details the Scenario 3 BS 4142:2014+A1:2019 assessment for the daytime operational hours at the NSR.

Table A5.3: Scenario 3 Assessment of Impacts

| Description | 5 Railway Terrace | Dan-y-Craig Caravan Park |
|--|----------------------|--------------------------|
| Predicted Specific Sound Level, dB $L_s = L_{Aeq,T}$ | 39 | 47 |
| Character Correction (Impulsivity) | +3 | +3 |
| Rating Level, dB $L_{A,r,Tr}$ | 42 | 50 |
| Background Sound Level, dB L_{A90} | 44 | 54 |
| Difference (Rating Level – Background Sound Level) | -2 | -4 |
| BS 4142:2014+A1:2019 Outcome | Low Impact Indicated | Low Impact Indicated |

A5.6 **Table A5.3** shows that, under Scenario 3, the assessment outcome indicates a 'Low Impact' at both NSR.

Scenario 4 (Worst-Case for Dan-y-Craig Caravan Park with Crusher Not Operating)

A5.7 **Table A5.4** details the Scenario 4 BS 4142:2014+A1:2019 assessment for the daytime operational hours at the NSR.

Table A5.4: Scenario 4 Assessment of Impacts

| Description | 5 Railway Terrace | Dan-y-Craig Caravan Park |
|--|----------------------|--------------------------|
| Predicted Specific Sound Level, dB $L_s = L_{Aeq,T}$ | 37 | 41 |
| Character Correction (Impulsivity) | +3 | +3 |
| Rating Level, dB $L_{A,r,Tr}$ | 40 | 44 |
| Background Sound Level, dB L_{A90} | 44 | 54 |
| Difference (Rating Level – Background Sound Level) | -4 | -10 |
| BS 4142:2014+A1:2019 Outcome | Low Impact Indicated | Low Impact Indicated |

A5.8 **Table A5.4** shows that, under Scenario 3, the assessment outcome indicates a '**Low Impact**' at both NSR.

Figure A6.1: Model Results – Scenario 1



Figure A6.2: Model Results – Scenario 2

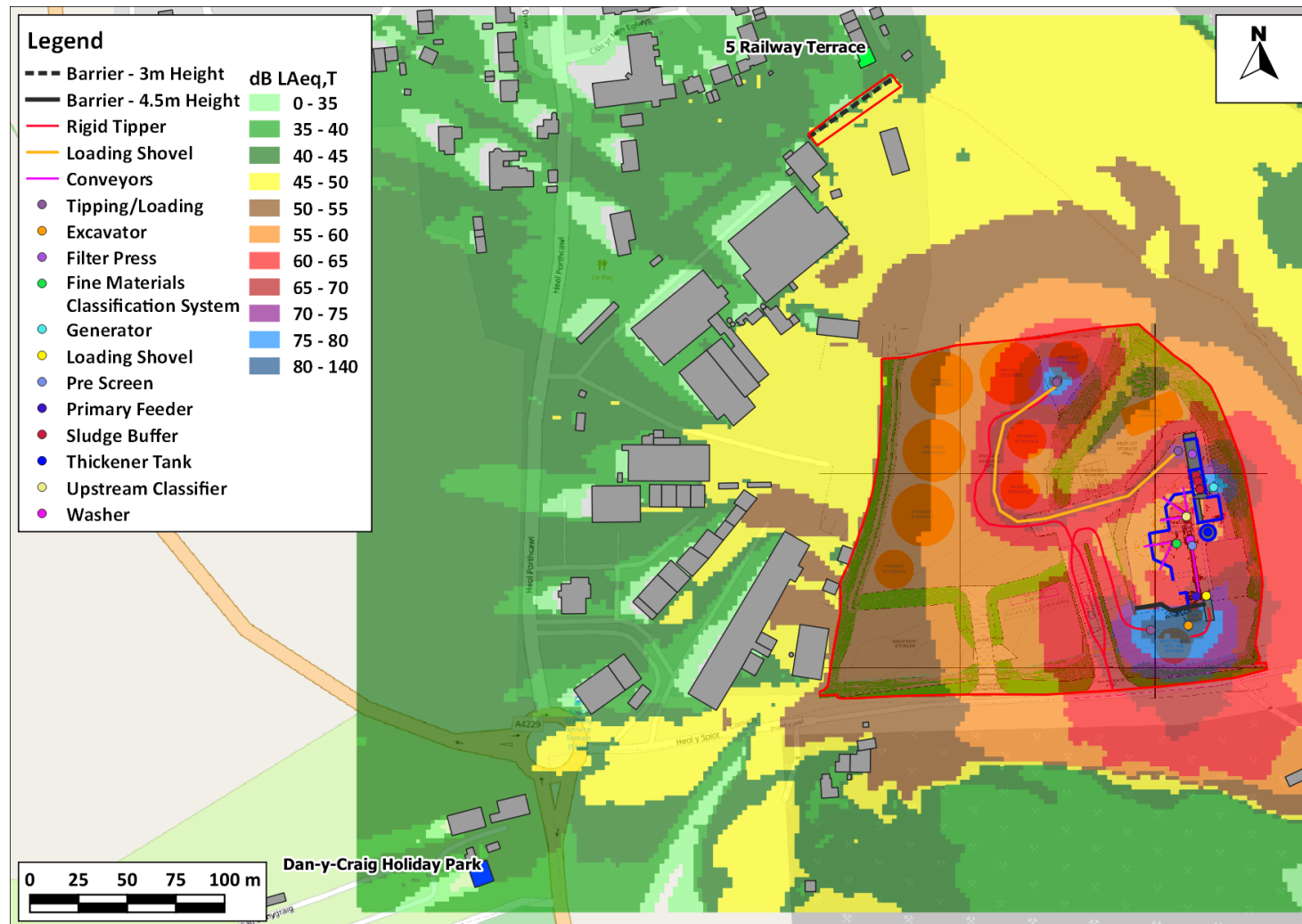


Figure A6.3: Model Results – Scenario 3

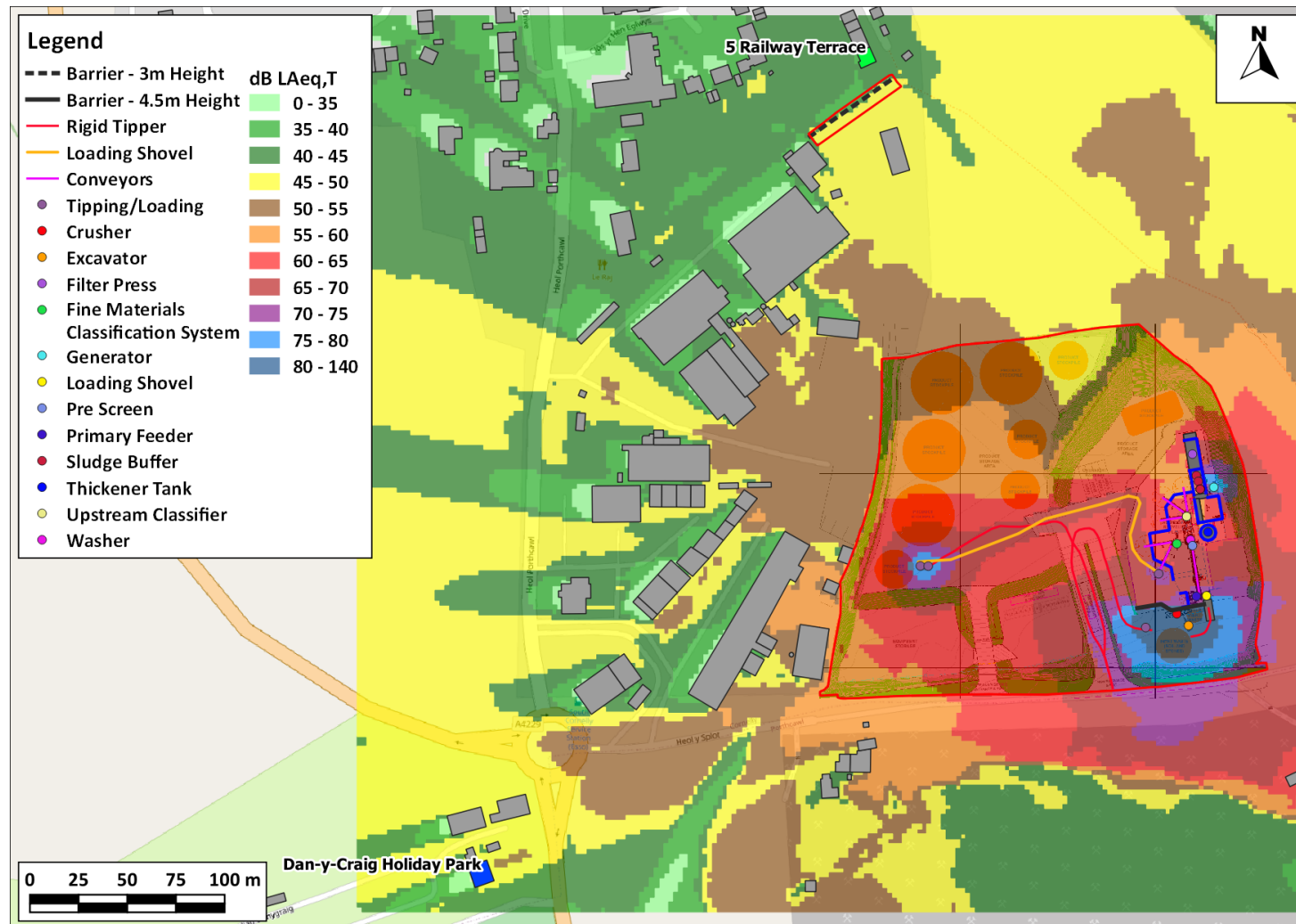


Figure A6.4: Model Results – Scenario 4

