Noise Impact Assessment

CDFA Processing Plant, Land at the former Fiddlers Ferry Power Station Site, Warrington, Cheshire

TITAN CEMENT UK

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1.0 INTRODUCTION

1.1 Overview

1.1.1 Vibrock Limited are commissioned to undertake a noise impact assessment in relation to the operation of a Coal Derived Fly Ash (CDFA) Processing Plant on land at Fiddlers Ferry Power Station in Warrington.

1.1.2 This study benefits from a site inspection and sound level monitoring undertaken in June 2024. An assessment of the potential impact of the proposals at noise-sensitive receptors in the vicinity of the proposed application area has been made by comparison of predicted site noise levels with relevant policy and guidance. Where necessary suitable mitigation measures have been recommended.

1.1.3 Whilst existing residential premises are distant from the site there are sports pitches and areas of mixed-use development including housing proposed to the east of the site as part of the wider large-scale redevelopment of the area. To the south, there are a number of lagoons which have been identified as 'Functionally Linked Land' for Teal which are one of the bird species that the Mersey Estuary Special Protection Area is designated for. The potential impacts on these ecological receptors has also been considered within this report in addition to the above.

1.1.4 Further explanation of the terminology used within this report is provided in Appendix A.

1.2 Existing Site

1.2.1 Fiddlers Ferry Power Station was closed in March 2020 and the site was identified in the Warrington Local Plan 2021/22-2038/39 adopted in December 2023 as a key area for mixed use redevelopment comprising industrial and residential use.

1.2.2 A Development Framework for the regeneration of the site includes maintaining an existing Ash Processing Plant to process a resource of CDFA which is located in the former settling lagoons of the Power Station site. Planning permission reference A00/41935 was granted in October 2001 for the installation of an Ash Processing Plant which was amended in September 2006 by planning permission reference 2006/08845 to extend the commencement date for the development.

1.2.3 The site the subject of the proposed application is approximately 1.9 ha and shown in Figures 1 and 2. The existing site comprises a main building which houses CDFA processing equipment together with a smaller existing storage shed to the south which is connected to the main building by raised pipework and conveyor. Infrastructure external to the buildings comprises storage silos and loading gantries to the north and west, an emission stack and further infrastructure to the north and east.

1.2.4 Beyond the wider power station site the local environment is characterised by agricultural land to the north and east, industrial land to the west and the River Mersey and further industrial land to the south. A railway line running east to west and the St Helens Canal which runs parallel to the railway separate the ash processing plant site from the associated ash deposition lagoons to the south. Access to the deposited CDFA from the main power station site is via a road bridge over the railway and canal.

1.3 Proposals

1.3.1 As an integral part of the objectives of the wider redevelopment operations at the site, Titan Cement UK (Titan) propose to continue the extraction of CDFA from the lagoons and process it into a product that can be used as a direct replacement for cement in concrete. The benefits of this include lowering the overall carbon dioxide content of the finished concrete product, as well as improving concrete properties such as overall strength and improved permeability performance.

1.3.2 The planning application seeks permission to make alterations to the existing Ash Processing Plant to upgrade and improve the recovery technology. The changes will comprise the installation of new plant and machinery for the processing of CDFA, extensions to the existing buildings and the addition of external silos and generators. The proposals are for changes and extensions to an existing consented Ash Processing Plant which also has an Environmental Permit in place. The development proposals are shown in Figures 3 and 4.

1.3.3 In addition it is proposed that the currently consented life of the APP is extended to accommodate a remaining operational life of 20 years which is needed to process the CDFA resource in the lagoons. The extraction of CDFA is covered by separate planning permission.

1.3.4 Ash from the existing lagoons to the south of the site will be extracted, screened and transported via dump-truck to the plant site where it will be stockpiled inside a building which also contains a hopper and conveyor system allowing a loading shovel to feed the plant. The ash is processed and the final products are stored in silos before being loaded into HGVs for transport off-site to the market via road.

1.3.5 It is understood that the processing plant would operate on a 24/7 basis, however, dump-truck and HGV movements (including loading/collections and deliveries) would take place from 06:30 – 21:30 Monday to Friday and between 06:30 to 14:30 on Saturdays.

2.0 ASSESSMENT CRITERIA

2.1 National Planning Policy and Guidance

Noise Policy Statement for England (NPSE)

2.1.1 The NPSE sets out the Government's policy on noise and includes the long term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

2.1.2 This long term vision is supported by the following aims:

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

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

2.1.3 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- NOEL (No Observed Effect Level) – this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected.

2.1.4 Extending these concepts further, NPSE leads to the concept of a significant observed adverse effect level:

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

2.1.5 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

National Planning Policy Framework (NPPF)

2.1.6 The NPPF was first published on 27 March 2012 and last updated in February 2025. This sets out the government's planning policies for England and how these are expected to be applied.

2.1.7 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 '*Conserving and enhancing the natural environment*' as follows:

Paragraph 187:

"Planning policies and decisions should contribute to and enhance the natural and local environment by……preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability."

Paragraph 198:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

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

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

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

Paragraph 200:

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

2.1.8 The NPPF makes specific reference to the importance of CDFA as follows:

Annex 2: Glossary

*'**Minerals resources of local and national importance**: Minerals which are necessary to meet society's needs, including aggregates, brickclay (especially Etruria Marl and fireclay), silica sand (including high grade silica sands), coal derived fly ash in single use deposits, cement raw materials, gypsum, salt, fluorspar, shallow and deep-mined coal, oil and gas (including conventional and unconventional hydrocarbons), tungsten, kaolin, ball clay, potash, polyhalite and local minerals of importance to heritage assets and local distinctiveness.'*

*'**Secondary aggregates**: aggregates from industrial wastes such as glass (cullet), incinerator bottom ash, coal derived fly ash, railway ballast, fine ceramic waste (pitcher), and scrap tyres; and industrial and minerals by-products, notably waste from china clay, coal and slate extraction and spent foundry sand. These can also include hydraulically bound materials.'*

Paragraph 223:

"*Planning policies should:*

a) provide for the extraction of mineral resources of local and national importance, but not identify new sites or extensions to existing sites for peat extraction;

b) so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously;

c) safeguard mineral resources by defining Mineral Safeguarding Areas; and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked);

d) set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development to take place;

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

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

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

h) *ensure that worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place*."

Planning Practice Guidance (PPG)

2.1.9 PPG is written in support of the NPPF and provides an increased level of specific planning guidance.

2.1.10 PPG-Noise states that "noise needs to be considered when new development may create additional noise or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). Where justified, noise can override other planning concerns, although it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern."

2.1.11 "Plan-making and decision taking need to take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur;

  and

- whether or not a good standard of amenity can be achieved."

2.1.12 In line with the Explanatory note of the NPSE this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level (SOAEL) and the lowest observed adverse effect level (LOAEL) for the given situation.

2.1.13 When noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'No Observed Effect Level'. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it.

2.1.14 As the exposure increases further, it crosses the LOAEL boundary above which the noise starts to cause small changes in behaviour and attitude and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

2.1.15 Increasing noise exposure will at some point cause the SOAEL boundary to be crossed. Above this level the noise causes a material change in behaviour. If the exposure is predicted to be above this level the planning process should be used to avoid, but not necessarily prevent, this effect occurring, for example through use of appropriate mitigation such as by altering the design and layout. The table below summarises the noise exposure hierarchy from PPG-Noise.

Table 1: Noise Exposure Hierarchy

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

2.2 Local Planning Policy

Warrington Local Plan 2021/22 - 2038/39 (Adopted December 2023)

Warrington's Local Plan was adopted on 4th December 2023. It provides the statutory planning framework for the entire Borough for the period 2021/22 to 2038/39.

The Local Plan will be used to guide decisions on planning applications and to identify areas where investment and growth should be prioritised. The Local Plan has replaced the Local Plan Core Strategy (2014).

Policy ENV8 - Environmental and Amenity Protection

General Principles

1. *The Council requires that all development is located and designed so as not to result in a harmful or cumulative impact on the natural and built environment, and/or general levels of amenity.*

2. *Development proposals, as appropriate to their nature and scale, should demonstrate that environmental risks have been evaluated and appropriate measures have been taken to minimise the risks of adverse impacts to air, land and water quality, whilst assessing vibration, light and noise pollution both during their construction and in their operation….*

Noise Pollution

11. *The Council encourages consideration for noise and acoustic mitigation during early stages of design, having regard for layout, siting and internal features.*

12. *Developments which are noise sensitive end uses near to busy roads or noisy existing businesses will need to demonstrate with any application that appropriate mitigation can be employed and implemented to prevent adverse impacts on health and quality of life for future site users. Such developments need to consider and implement the 'agent of change' principle in accordance within the NPPF.*

13. *New developments should not place unreasonable restrictions on existing businesses or business activities through the restriction of activities, prohibition of works or otherwise.*

14. *Development proposals generating noise which is likely to create significantly adverse impacts on health and quality of life and which cannot be mitigated and/or controlled through the use of conditions or through pre-existing effective legislative regimes, will not be permitted.*

General Amenity Protection

15. *Where development is considered to be appropriate but may still have impacts on the following environmental considerations, in addition to those detailed above, the Council will consider the use of conditions or planning obligations to ensure any appropriate mitigation or compensatory measures are secured:*

    a. Levels of odours, fumes, dust, smoke, insects, litter accumulation, and refuse collection/storage;
    b. Levels of light pollution and impacts on the night sky;
    c. The need to respect living conditions of existing neighbouring residential occupiers and future occupiers of new housing schemes in relation to overlooking/loss of privacy, outlook, sunlight, daylight, overshadowing, noise, vibration and disturbance;
    d. The need to protect existing occupiers and operators in the surrounding area from new development and its potential impacts;
    e. The effect and timing of traffic movement to, from and within the site and car parking including impacts on highway safety;
    f. The ability and the effect of using permitted development rights to change use within the same Use Class (as set out in the Town and Country Planning (General Permitted Development Order) without the need to obtain planning consent.

16. *Detailed assessments may be required to address any of the above criteria and will need to be submitted to the Council for approval. Where necessary information from assessments is absent to enable consideration of a specific matter, conditions may be recommended or the application refused based on lack of supporting information.*

Environmental Protection Supplementary Planning Document Adopted July 2024

Residential Development Schemes

Any residential use needs to consider all types of noise in the vicinity of the proposed new residential site. This can be transportation noise from road or rail; noise from commercial or other business activities ; and noise from entertainment and leisure venues close to the site.

The Council has adopted the World Health Organization (WHO) guideline values on domestic noise impacts. These guideline values should be attained wherever possible to minimise the adverse impacts on health, reduce sleep disturbance and reduce the various other physiological and psychological adverse health effects from elevated or excessive environmental noise.

Commercial or industrial near residential development schemes

Residential developments which are proposed close to existing commercial or industrial uses or other business activities need to be considered as to whether noise from the existing businesses may have adverse impacts on future residential amenity.

Assessments for commercial or industrial noise activities should utilise BS4142 although there are some limitations on what this can be used to assess. It is recommended to agree beforehand any assessment methodologies, especially where the activities fall outside of remit of BS4142 or other relevant guidance and standards. Where cumulative rated noise levels from business activities are just above the background noise levels at the proposed new residential development then this is an indication of potential adverse impact so appropriate mitigation may need to be identified. Where cumulative rated noise is significantly above the background noise levels then this may give rise to adverse impacts on amenity for future occupiers. These planning applications will be refused unless appropriate and effective mitigation can be identified and implemented.

Under the "agent of change" principle within the NPPF, new development should not cause existing businesses to have unreasonable restrictions placed upon them as the result. Where mitigation is practical for this then it should be implemented within the new development. Consideration of noise transmission into private amenity spaces or through partially open windows is a factor which whilst mitigation may help to reduce noise levels, may not eradicate noise to a satisfactory level, in which case a refusal recommendation might be made. Just because a window can be closed to achieve acceptable internal noise levels does not mean that the future occupier will choose to keep it closed. From an acoustic point of view, any development relying on closed windows to achieve acceptable internal noise levels, due to nearby business use, should ensure that these are not openable as if they are opened then adverse impacts and future complaints are likely

New Industrial or Commercial Development Schemes

Any proposed new commercial or industrial uses will have to consider any noise impacts that they may create and how that may impact adversely on existing nearby or neighbouring noise sensitive uses.

2.3 Technical Guidance

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

2.3.1 This British Standard was amended in June 2019. BS 4142:2014+A1:2019 supersedes BS 4142:2014, which is withdrawn.

2.3.2 This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

1) sound from industrial and manufacturing processes;
2) sound from fixed installations which comprise mechanical and electrical plant and equipment;
3) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and

4) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

2.3.3 The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

2.3.4 This standard is intended to be used for the purposes of:

a) investigating complaints;

b) assessing sound from existing, proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and

c) assessing sound at proposed new dwellings or premises used for residential purposes.

2.3.5 This standard is not intended to be applied for the following purposes:

- The determination of noise amounting to a nuisance;
- The assessment of indoor sound levels;
- The assessment of low-frequency noise;
- The assessment of sound from the passage of vehicles on public roads and railway systems;
- The assessment of sound from recreational activities, including all forms of motorsport;
- music and other entertainment;
- shooting grounds;
- construction and demolition;
- domestic animals; people;
- public address systems for speech;
- The assessment of sound from other sources falling within the scopes of other standards or guidance.

2.3.6 The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. When making assessments and arriving at decisions it is essential to place the sound in context.

2.3.7 The sound level from a source when determined as a discrete entity, distinct and free of other influences contributing to the ambient sound, is referred to as the 'specific sound level'. The specific sound level is evaluated, at an identified assessment location, over the appropriate reference time interval which is as follows:

- 1 hour during the daytime (07:00 – 23:00); and
- 15 minutes during the night-time (23:00 – 07:00).

NB. The shorter reference time interval at night means that short duration sounds with an on time of less than 1 hour can lead to a greater specific sound level when determined over the reference time interval during the night than when determined during the day.

2.3.8 The specific noise may be subject to an acoustic character correction if the noise level at the assessment location is subjectively considered to exhibit certain acoustic features that could increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level.

2.3.9 This standard requires the assessor to consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention. Such features are taken into account by applying corrections to the specific sound level to obtain the rating level as summarised in Table 2.

Table 2: Summary of BS 4142 Acoustic Feature Corrections

Subjective Prominence	Tonality	Impulsivity	Intermittency	Other Sound Characteristic (neither tonal, nor impulsive, nor intermittent)
Just Perceptible	+2 dB	+3 dB	-	-
Clearly Perceptible	+4 dB	+6 dB	-	-
Highly Perceptible	+6 dB	+9 dB	-	-
Readily Distinctive Against Residual Environment	-	-	3 dB	3 dB

2.3.10 If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others then it might be appropriate to apply a reduced or even zero correction for the minor characteristics. The rating level is equal to the specific sound level if there are no such features present or expected to be present.

2.3.11 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level, and consider the following.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB or more 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.

2.3.12 Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) The absolute level of sound.

2) The character and level of the residual sound compared to the character and level of the specific sound.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

i) façade insulation treatment;

ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

iii) acoustic screening.

2.3.13 Response to sound can be subjective and is affected by many factors both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood. This edition of the standard recognises the importance of the context in which a sound occurs.

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

2.3.14 This Standard provides guidance for the control of noise in and around buildings and is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

2.3.15 For dwellings, the main considerations are:

a) for bedrooms, the acoustic effect on sleep; and
b) for other rooms, the acoustic effect on resting, listening and communicating.

2.3.16 It is desirable that the internal ambient noise level does not exceed the guideline values detailed in Table 3 below.

Table 3: Indoor ambient noise levels for dwellings (From Table 4 of BS 8233)

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

2.3.17 For traditional external areas that are used for amenity space, such as gardens, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$.

World Health Organisation (WHO)

2.3.18 The World Health Organisation '*Guidelines for Community Noise*' 1999 aims to provide environmental health authorities and professionals with guidance on the adverse health effects of community noise on people.

2.3.19 This document presents a summary of research and opinions on the impacts of noise and recommends guideline values for avoidance of particular effects e.g. annoyance and sleep disturbance. It is the primary reference point for other guidance value based documents, such as BS 8233.

2.3.20 The following guideline values have been derived according to specific environments. The values relevant to residential development are shown in Table 4 below.

Table 4: Guideline values for community noise in specific environments. (From Table 4.1 of WHO Guidelines)

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time base (hrs)	$L_{Amax,f}$ (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45

2.4 Technical Guidance

2.4.1 In addition to the planning application for the CDFA processing facility, this noise impact assessment will also accompany an application to the Environment Agency to update the Environmental Permit. The EA guidance is summarised below.

Environment Agency Guidance: Noise and vibration management: environmental permits

2.4.2 Operators (or permit applicants) must consider the potential noise impact of their site. They may need to carry out noise impact assessments:

- at the permit application stage
- when applying to vary a permit
- to comply with specific permit conditions

2.4.3 Where noise is possibly causing an impact, the operator must carry out an assessment to determine:

- the level of impact
- how much work needs to be done to prevent or minimise noise pollution

2.4.4 For assessment purposes, '*BS 4142: Methods for rating and assessing industrial and commercial sound*' must be used to quantify the level of environmental noise impact from industrial processes.

2.4.5 Noise impact assessments should be carried out to an appropriate standard and by competent personnel, for example, holders of either an Institute of Acoustics:

- Diploma in Acoustics and Noise Control
- Certificate of Competence in Environmental Noise Measurement, with relevant experience

2.4.6 Operators must prevent significant pollution and also comply with the requirements to use 'appropriate measures' (Waste Framework Directive 2018/851) or 'best available techniques' (BAT) to prevent or minimise noise pollution.

2.4.7 For any particular case, the environment agencies have to decide whether or not you are causing (or are likely to cause) unacceptable noise pollution, even if appropriate measures are used. It is the responsibility of the operator to avoid significant pollution and to demonstrate the use of BAT or appropriate measures to prevent, or where that is not practicable, to minimise noise impact.

3.0 BASELINE NOISE SURVEY

3.1 Survey Methodology

3.1.1 Measurements were undertaken with reference to the guidance presented within BS 7445 and BS 4142 which provide advice in relation to methods and procedures for environmental noise monitoring along with guidance on measurement parameters, instrumentation and the information to be reported.

3.1.2 Sound levels were measured over a period of approximately 1 week from 20 – 28 June 2024. Measurements were made at a location selected to represent potential future residential development in the vicinity of the processing plant site. A location plan showing the noise assessment locations in relation to the site is provided in Figure 5.

3.1.3 In addition to proposed residential development and proposed sports pitches, noise levels within an area to the south of the application site have also been considered. Lagoons B and C (also shown in Figure 5) have been identified as 'Functionally Linked Land' for Teal which are one of the bird species that the Mersey Estuary Special Protection Area is designated for.

3.2 Instrumentation

3.2.1 Monitoring was undertaken using the equipment detailed in Table 5.

Table 5: Noise Monitoring Equipment

Manufacturer	Type	Serial No.	Date of last calibration
Cirrus	Class 1 Integrating Sound Level Meter CR:1710	G300462	26/08/22
Cirrus	Acoustic Calibrator CR:515	56097	07/11/23

3.2.2 During the survey the microphones were protected with a suitable outdoor windshield and mounted on a tripod. The monitoring position was 'free field' (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

3.2.3 The following set-up parameters were used:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: 15 min
- Data Logging: Repeat (Contiguous)

3.2.4 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a sound calibrator. No significant drift (i.e. no greater than ±0.5 dB) in the calibration value of 93.7 dB was observed between the initial and final checks.

3.3 Observations

3.3.1 The acoustic environment at the assessment location predominantly comprises noise from distant road traffic along with occasional agricultural activity and aircraft. Distant rail traffic and birdsong also contributed to the noise climate at the monitoring location. The land at the monitoring location is currently in arable use and was being worked at times during the survey.

3.3.2 Weather conditions during the survey were measured using a portable Davis Vantage Vue Precision Weather Station located at the noise monitoring location. The data obtained is shown in Figure 6. Weather conditions during the survey varied but were dry and generally settled with average wind speeds of around 2 ms^{-1}, predominantly from the north-west and east-south-east over the course of the week. There were occasional periods of higher wind speeds and gusts which have the potential to influence the measured sound levels. Relative humidity varied between 45 – 95% and temperatures ranged from 10 – 28°C.

3.4 Results

3.4.1 The measurement data collected during the survey is presented in Figure 7 and Appendix B and summarised in Table 6 below. Where necessary, any atypical data (such as that influenced by high wind speeds and agricultural activity in close proximity to the monitoring location) has been excluded from the assessment via post-survey analysis.

Table 6: Measured Sound Levels

Date	Period	Ambient Sound Level Average $L_{Aeq,T}$ (free-field) dB		Background Sound Level $L_{A90,T}$ (free-field) dB	
		Daytime 0700 – 2300	Night-time 2300 – 0700	Daytime 0700 – 2300	Night-time 2300 – 0700
20 – 28th June 2024	Overall	42.8	41.2	36.0	32.8
20/06/2024	Thursday	41.4	39.7	34.7	33.3
21/06/2024	Friday	no data*	39.1	no data*	33.6
22/06/2024	Saturday	43.9	35.4	36.6	30.3
23/06/2024	Sunday	41.9	36.7	34.7	31.0
24/06/2024	Monday	38.9	38.7	34.1	32.9
25/06/2024	Tuesday	44.3	41.7	38.2	33.8
26/06/2024	Wednesday	43.1	46.4	38.3	35.0
27/06/2024	Thursday	47.2	no data*	39.2	no data*
28/06/2024	Friday	no data*	no data*	no data*	no data*

** No data remaining for the period following exclusions*

4.0 POTENTIAL NOISE EMISSIONS

4.1 Introduction

4.1.1 The level of noise in the local environs that arises from a site will depend on a number of factors. The more significant of which are:

(a) the sound level output of the plant or equipment used on site;
(b) the periods of operation of the plant on site;
(c) the distance between the source noise and the receiving position;
(d) the presence of screening due to barriers;
(e) the reflection of sound;
(f) soft ground attenuation.

4.1.2 Noise levels from operations associated with the proposed development have been calculated at the identified assessment locations based on the following methodologies and assumptions.

4.2 Calculation Methodology

4.2.1 In order to assist in the calculation of predicted noise levels from the site, CadnaA noise modelling software has been used. The noise prediction software has been configured to undertake the noise calculations in accordance with ISO 9613 '*Acoustics - Attenuation of sound during propagation outdoors*' which is an Environment Agency requirement. Noise model configuration details are outlined in Table 7 below.

Table 7: Noise Model Configuration Details

Parameter	Input
Software	DataKustik GmbH CadnaA 2026 (build: 213.5606)
Calculation Standards/Guidelines	ISO 9613-2:2024
Model of Terrain	Triangulation
Max. Order of Reflection	2
Ground Attenuation	Spectral
Frequency Band Calculation	Broadband (500 Hz)
Temperature	10°C
Relative Humidity	70%
Topographic data	3D contour data – 1.0m DTM EA LiDAR
Ground Absorption	0.95 (Resolution 1.0m), Site 0.30, Lagoons 0.10
Receiver Heights	Residential: Daytime 1.5m agl – ground floor/gardens Residential: Night-time 4.0m agl – bedroom windows Sports Pitches 1.5m, Lagoon Areas 0.5m

4.2.2 Within the model, vehicle movements have been modelled as line sources. Point sources have been used to represent external stationary or quasi-stationary activities such as fixed plant and the loading of materials. Horizontal and vertical area sources have been used to represent internal noise break out through building facades and openings.

4.2.3 For all noise prediction calculations, the ground absorption coefficient has been estimated according to the combination of soft and hard ground conditions present between the source and receiver position. 'Soft' ground is taken to refer to surfaces which are absorbent to sound, e.g. grassland, cultivated land or plantations as opposed to 'hard' ground surfaces which reflect sound such as paving, asphalt and surface water.

4.2.4 The calculation methodology assumes conditions favouring sound propagation from source to receiver i.e. wind direction with $\pm 45^0$ of the direction connecting the centre of the dominant sound sources and the centre of the specified receptor region, together with wind speeds of between 1 – 5 ms^{-1}.

4.2.5 The predictions made by the modelling software are for 'free-field' sound levels to allow for an appropriate comparison with the free-field background sound levels measured during the survey. The convention applied within BS 4142, and throughout this report, is that all measured or calculated numbers are rounded to the nearest whole number with 0.5 being rounded up.

4.3 Noise Source Details

4.3.1 Information regarding potential operations at the site has been based on a site inspection and details provided by Titan. This information is shown in Appendix C.

4.3.2 Noise source model inputs are detailed in Table 8 below.

Table 8: Noise Source Model Inputs

Name	L_w	Att.	Operating Time		Coordinates		
	dBA	dB	Day	Night	X	Y	Z
			%	%	(m)	(m)	(m)
Point Sources							
Hi-Speed Paddle Mixer	83	0	50	0	354733	386097	19.3
27Hi_Carbon_Vent_Filter1	93	0	10	10	354722	386101	41.5
27Hi_Carbon_Vent_Filter2	93	0	10	10	354710	386102	41.5
18/20Silo_Vent_Filter1	93	0	10	10	354685	386075	41.5
18/20Silo_Vent_Filter2	93	0	10	10	354683	386064	41.5
19/21Silo_Aeration_Blow1	93	0	100	100	354680	386076	13.8
19/21Silo_Aeration_Blow2	93	0	100	100	354679	386064	13.8
18/20Silo_Vent_Filter3	93	0	10	10	354682	386052	41.5
19/21Silo_Aeration_Blow3	93	0	100	100	354677	386053	13.8
Tanker Idle	89	0	50	0	354685	386076	14.5

Name	L_w	Att.	Operating Time		Coordinates		
	dBA	dB	Day	Night	X	Y	Z
			%	%	(m)	(m)	(m)
Tanker Idle	89	0	50	0	354684	386065	14.5
Tanker Idle	89	0	50	0	354732	386097	14.8
Tanker Idle	89	0	50	0	354682	386054	14.5
Flue1	83	0	100	100	354697	386042	31.5
Flue2	83	0	100	100	354702	386042	31.5
Flue3	83	0	100	100	354707	386041	31.5
Flue4	83	0	100	100	354712	386041	31.5
Flue5	83	0	100	100	354717	386040	31.5
Flue6	83	0	100	100	354722	386040	31.5
GasG1	103	10	100	100	354743	386053	17.1
GasG2	103	10	100	100	354743	386058	17.1
DieselG1	100	0	100	0	354744	386063	15.0
DieselG2	100	0	100	0	354745	386068	15.0
FlueG2	83	0	100	100	354718	386043	31.5
FlueG1	83	0	100	100	354703	386044	31.5
Line Sources (Moving Pt. Src)							
Road Tanker	101	0	8/hr	0/hr	Height 1.5m / Speed = 24 kmph		
Dumper	105	0	18/hr	0/hr	Height 2.0m / Speed = 24 kmph		

4.4 Calculation/Modelling Results

4.4.1 Tables 9 and 10 summarises the results of the noise level predictions at the identified assessment locations.

Table 9: Calculation Results (Residential Receptors)

Assessment Location	Calculated Specific Sound Level $L_{Aeq,Tr}$ (free-field) dB	
	Daytime	Night-time
Potential Future Residential Development	37.9	34.3

Table 10: Calculation Results (Other Receptors)

Assessment Location	Calculated Specific Sound Level L_{Aeq} dB
Proposed Sports Pitches – Western Boundary	39.3
Proposed Sports Pitches – Eastern Boundary	34.2
FFL Lagoon B (Northern Boundary)	30.1
FFL Lagoon C (Northern Boundary)	25.3

5.0 ASSESSMENT

5.1 BS 4142 Assessment – Potential Future Residential Development

5.1.1 This assessment has been undertaken with reference to the guidance provided within BS 4142.

5.1.2 This standard requires the following levels to be established:

- The Background Sound Level
- The Specific Sound Level
- The Rating Level

Background Sound Level

5.1.3 BS 4142 requires the quantification of typical background sound levels at locations representing the noise-sensitive receptors. The results of the survey are presented in Section 3 of this report.

Specific Sound Level

5.1.4 The specific sound level has been determined by calculation following the guidance within Section 7 of BS 4142. The method of calculation is explained in Section 4 of this report.

Rating Level

5.1.5 In determining the Rating Level it is recognised that certain acoustic features can increase the significance of noise impact over that expected from a basic comparison between the specific sound level and the background sound level.

5.1.6 Noise emissions associated with operations at the site are not considered to contain any significant tonal or intermittent features, however, it is considered that the sound could on occasions contain impulsive features that are discernible at night. Such characteristics are likely to be primarily associated with the silo venting filters units which emit a brief jet of air approximately once every minute.

5.1.7 In accordance with BS 4142 it is therefore considered appropriate to apply a correction of + 3 dB to the calculated night-time specific sound levels to account for the presence of these characteristics which could at times be just perceptible at noise-sensitive premises in the vicinity. During the daytime, residual sounds are likely to mask any acoustic features from the proposed site and it is therefore not considered necessary to apply an acoustic feature correction to the specific sound level during the daytime.

Estimate of Impact

5.1.8 Table 11 below presents an estimate of the potential impact of the proposals in accordance with BS 4142.

Table 11: Estimate of Impact (BS 4142)

Assessment Location	Background Sound Level ($L_{A90,1h}$ dB)	Specific Sound Level ($L_{Aeq,1h}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Initial Estimate Excess of rating over background sound level (dB)
Potential Future Residential Development	**Daytime**				
	36	38	0	38	**+2**
	Night-time				
	33	34	+3	37	**+4**

5.1.9 Typically, the greater the difference between the rating level and the background sound level, the greater the magnitude of the impact.

5.1.10 BS 4142 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. A difference of around +5 dB is likely to be an indication of an adverse impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

5.1.11 It should be noted that the initial estimate of impact is not to be considered in isolation and due regard to the following sections on context and uncertainty should also be made.

Context

5.1.12 In addition to the estimate of noise impact which has determined the excess of rating level over background sound level, the following should also be considered as part of the impact assessment process:

- *Operational Period* – Whilst vehicle and mobile plant movements to and from the site are only likely to occur during daytime weekday periods, the ash processing plant could operate on a 24/7 basis and there is therefore a higher likelihood of adverse impact compared to operations which occur during less sensitive periods such as the daytime only.

- *Character of the Sound* – As part of the assessment the potential character of the sound has been assessed and an acoustic feature correction applied accordingly in accordance with BS 4142. The existing acoustic environment at the site is influenced predominantly by distant road traffic but also comprises a range of other industrial and commercial sound sources. As part of the wider regeneration of Fiddlers Ferry it is expected that the plant, which is built and has an environmental permit in place for its operation, would sit within an area designated for industrial/commercial use. Overall, the character of the sound from the site under assessment is not considered incongruous with both the historic and potential future use of the area.

- *Absolute Level of Sound* – In some circumstances, absolute noise levels can be as, or more, relevant than the margin by which the rating level exceeds the background, this is especially true at night. With reference to the guide values recommended by BS 8233 and WHO, worst-case external noise levels from the site are expected to be in the region of 34 – 38 dB and noise emissions from the site are therefore considered likely to have a low impact on residents using private external amenity areas during the daytime. During the night-time, these external levels equate to internal sound levels of 30 dB or less with windows open which suggests that there are also unlikely to be any significant adverse effects on residents using bedrooms.

- *Comparison to the Residual Sound* – Potential noise emissions from the site are below the residual daytime and night-time sound levels which are in the region of 43 and 41 dB respectively at the assessment location. It is anticipated that, once the redevelopment of the area has taken place, environmental noise levels at the assessment location would be higher than at present. This is due to the presence of localised sources of noise such as road traffic, local small businesses, public amenities, and general domestic noise compared to the current arable use of the land.

- *Future Noise-Sensitive Development* – The nearest existing noise-sensitive receptors are more than 650m away from the processing plant site. This report has been commissioned as a result of the wider re-development of the area and the potential for residential development to be constructed around 200m from the processing plant site. The National Planning Policy Framework, under which any proposed residential development would be tested, places the onus on the housing developer (the 'agent of change') to ensure that suitable noise mitigation measures are incorporated into the scheme. Para 193 of the NPPF states that '*Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business could have a significant adverse effect on new development in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed*'.

Uncertainty

5.1.13 Whilst it is accepted that uncertainty can occur throughout all aspects of the noise measurement and assessment process, the approach undertaken at all stages has been adopted with the aim of reducing uncertainty via the implementation of good practice. During this process reference has been made to BS 4142 Annex B '*Consideration of uncertainty and good practice for reducing uncertainty*'.

5.1.14 The following list details the key steps taken to reduce uncertainty:

- Background sound level measurements were made over a long duration to ensure that the acoustic environment was accurately characterised;
- The instrumentation used was in accordance with Section 5 of BS 4142. Use of digital transfer methods and equipment whose conformity and calibration have been checked periodically;
- Measurement procedures were in accordance with Section 6 of BS 4142 including precautions against interference such as unsuitable weather conditions. Meteorological conditions were recorded throughout the survey using a portable weather station located at the monitoring location;
- Site noise levels were determined by calculation with reference to Section 7 of BS 4142 and utilising the methodology outlined within ISO 9613 which is a widely accepted standard for the calculation of outdoor sound propagation.

5.2 Planning Policy and Guidance

5.2.1 Based on the BS 4142 assessment presented in section 5.1, and with reference to the noise exposure hierarchy outlined in PPG-Noise which supports the NPPF and NPSE, it is suggested that potential noise at the most affected noise-sensitive premises is likely to be occasionally present but not intrusive.

5.2.2 The potential noise exposure is therefore considered not to exceed the 'Lowest Observed Adverse Effect Level (LOAEL) threshold. At this level noise can be heard, but does not cause any change in behaviour, attitude, or other physiological response. It can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.

5.2.3 At a local level the proposed development also accords with Policy ENV8 of the Warrington Local Plan which seeks to ensure that adverse impacts are minimised via the implementation of appropriate mitigation measures and that development does not result in pollution which would cause unacceptable risks to the natural environment or general amenity.

5.3 Ecological Receptors

5.3.1 There are no statutory designated areas within the immediate vicinity of the ash processing plant, however, it is understood that the Lagoons B and C within the Fiddlers Ferry Lagoon area to the south have been identified as 'Functionally Linked Land' for birds such as Teal which are one of the species that the Mersey Estuary Special Protection Area is designated for.

5.3.2 The Lagoon Area was created primarily for the deposition of ash from the power station and the area has also been subject to commercial extraction of pulverised fly ash for cement production. This has resulted in the formation of various waterbodies that are suitable for bird assemblages and are close enough to the ash processing plant to require consideration.

5.3.3 There are no approved guide values or thresholds against which to assess the noise impacts on ecological receptors, largely due to the wide range of tolerances to noise found across animal phyla and even across different species of birds. However, it is noted that birds are known to habituate and to become increasingly tolerant of regular noise over time.

5.3.4 A review of relevant literature relating noise disturbance effects on waterbirds, suggests that noise levels below 55 dBA classify as low-level noise, which is unlikely to cause a behavioural response of waterbirds using a frontal intertidal area. In addition to this, Natural England suggest that an increase in the existing ambient noise levels of 3 dB or more could cause an increased vigilance behavioural response in waterbirds

5.3.5 The noise modelling results presented in Table 10 show that noise from the site could be in region of 25 – 30 dB at Lagoons B and C and therefore well within this 55 dB limit.

5.3.6 Noise level measurements of the existing conditions within the lagoon areas were made as part of the Phase 1 Construction Noise Assessment produced by Wardell Armstong in 2024. The existing ambient noise levels were shown to be in the region of 42 dB L_{Aeq}. When potential noise from the proposed ash processing operations are combined with the prevailing acoustic environment the following changes in the overall ambient noise level would be expected.

Table 12: Noise Level Change

Assessment Location	Existing Ambient Sound Level $L_{Aeq,T}$ dB	Site Noise Level $L_{Aeq,T}$ dB	Potential Future Ambient Noise Level	Change in Noise Level dB(A)
FFL Lagoon B (Northern Boundary)	42	30.1	42.3	+0.3
FFL Lagoon C (Northern Boundary)	42	25.3	42.1	+0.1

5.3.7 The calculations presented in Table 12 indicate that the potential increase in the ambient noise levels within the lagoon areas are expected to be well below the 3 dB or more significance criteria adopted by Natural England. The potential noise impacts on qualifying bird species using the lagoons is therefore not considered to be significant.

5.4 Proposed Sports Pitches

5.4.1 Sports Pitches are typically regarded as having a very low sensitivity in relation to the impacts from noise upon their use and are more typically viewed as a potential source of noise that could cause disturbance to people who live and work in the vicinity of them.

5.4.2 With reference to the results of the noise modelling shown in Table 10, noise levels from the proposed ash processing operations are likely to be in the region of 34 – 39 dB L_{Aeq} across the area potentially designated for proposed sports pitches. Noise levels of this magnitude are high unlikely to result in any significant interference or disturbance should this area accommodate outdoor sports facilities in the future.

6.0 NOISE MITIGATION

6.1 The existing elements of the ash processing plant benefit from being contained within fairly modern steel-frame cladded buildings with some external plant items.

6.2 The proposed modifications, will enclose some of the existing external plant and add further insulated cladding to create larger storage facilities.

6.3 All new external plant such as silo vent filters and flue terminations will be fitted with silencers where possible.

6.4 Two new external gas generators, which will run continuously, will be supplied with manufacturer fitted noise abatement kits and also be placed within a large acoustic screen/enclosure. Two smaller diesel generators will also be located in the acoustic compound.

6.5 No changes are proposed to the high speed spin mixer although this item is not frequently used and would only operate during the daytime period.

6.6 No articulated dump trucks bringing extracted materials into dry storage will operate outside the hours of the normal daytime working hours. Road Tankers to and from the site making deliveries or collections will also observe these hours.

7.0 SUMMARY

7.1 An assessment of potential noise impact associated with the future operation of the ash processing plant has been made following the guidance presented within BS 4142.

7.2 Following an initial estimate of noise impact, along with consideration of the context and any potential effects of uncertainty, the development is not considered likely to result in 'adverse' or 'significant adverse' impacts. This is also the case in relation to observed effect level thresholds of the noise exposure hierarchy detailed in national planning practice guidance.

7.3 A discussion in relation to the potential noise impacts on qualifying bird species using the nearby lagoon areas has also been presented which indicates that the likelihood of potential disturbance is low and therefore not significant.

7.4 Based on the outcome of the assessment it is unlikely that the proposed development would result in significant or unacceptable adverse impacts at noise-sensitive premises in the vicinity of the site.

7.5 The overall noise impact of the proposed development is therefore considered to be in line with current national and local planning policy which seeks to prevent and avoid any significant or unacceptable adverse impacts and, where necessary, mitigate and reduce to a minimum other adverse impacts.

7.0 REFERENCES

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2. BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*, British Standards Institution 2019.

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5. *Guidelines for Community Noise*. World Health Organization (WHO) 1999.

6. *Guidelines for Environmental Noise Impact Assessment*, v1.2. Institute of Environmental Management & Assessment. November 2014.

7. *Guidance: Method implementation document (MID) for BS 4142.* Environment Agency. Published March 2023, last updated December 2023.

8. *Guidance: Noise impact assessments involving calculations or modelling. Environment Agency.* Published October 2018, last updated August 2022.

9. *Guidance: Noise and vibration management: environmental permits*. Environment Agency. Published July 2021, last updated January 2022.

10. *Guidance: Risk assessments for your environmental permit.* Environment Agency and Department for Environment, Food and Rural Affairs. Published February 2016, last updated January 2025.

11. ISO 9613-2:2024 *Acoustics – Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors*. Edition 2, 2024.

12. National Planning Policy Framework – Ministry of Housing, Communities and Local Government, Ministry of Housing, Communities & Local Government (2018 to 2021) and Department for Levelling Up, Housing and Communities. Published March 2012, last updated February 2025.

13. Noise Policy Statement for England. Department for Environment, Food and Rural Affairs. March 2010.

14. Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government, Ministry of Housing, Communities and Local Government (2018 to 2021) and Department for Levelling Up, Housing and Communities. March 2014 last updated July 2019.

15. Warrington Local Plan 2021/22 - 2038/39 (Adopted December 2023).

16. Cutts, N.D., Phelps, A., & Burdon, D., 2009. Construction and waterfowl: Defining sensitivity, response, impacts and guidance. Report to Humber INCA. Institute of Estuarine & Coastal Studies, University of Hull; Cutts et al., 2013 Cutts, N., Hemingway, K. and Spencer, J. (2013). Waterbird disturbance mitigation toolkit: Informing estuarine planning and construction Projects. Version 3.2, March 2013.

FIGURE 1

Site Location Plan

FIGURE 2

Existing Site Layout

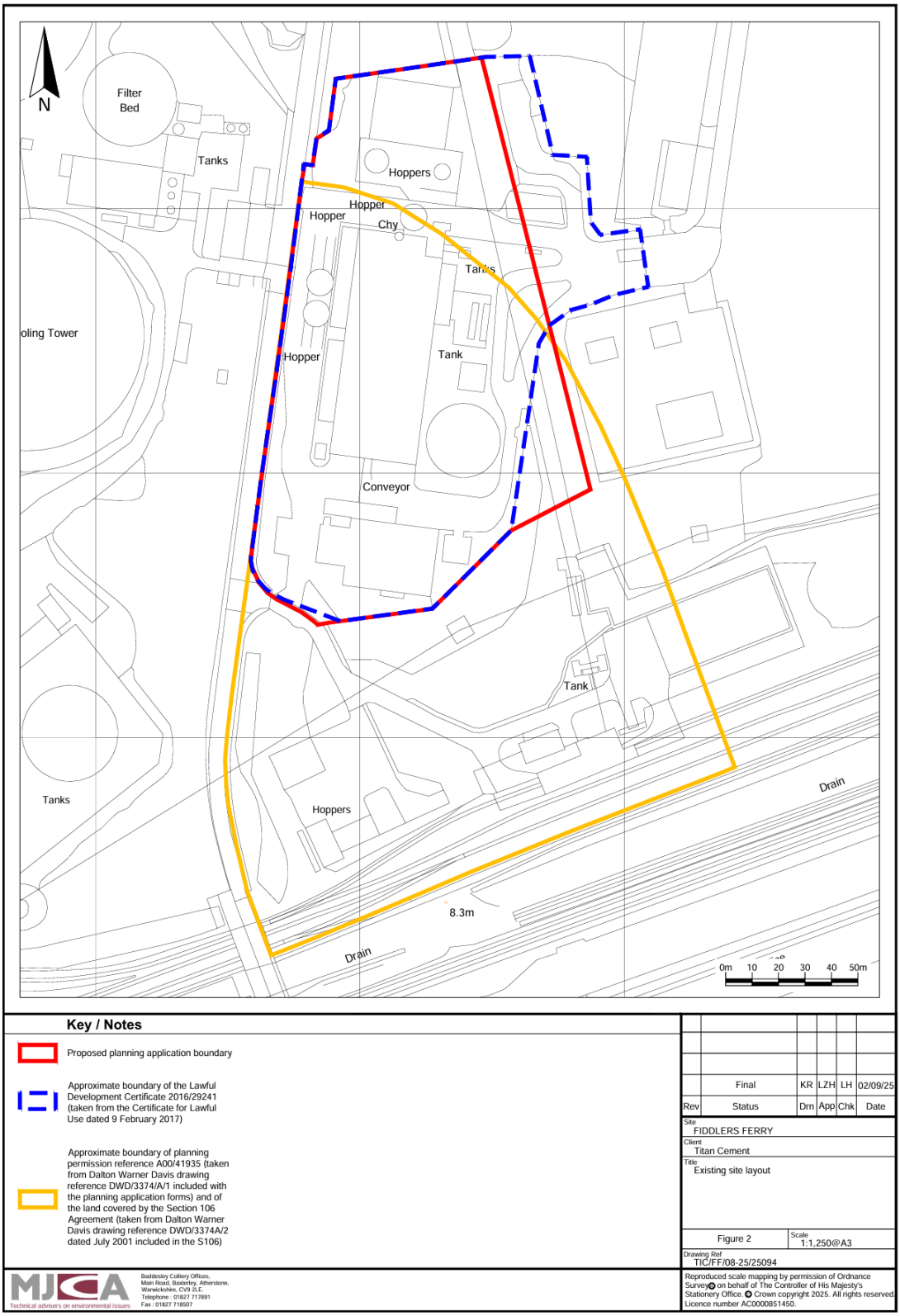


FIGURE 3

Proposed Site Layout

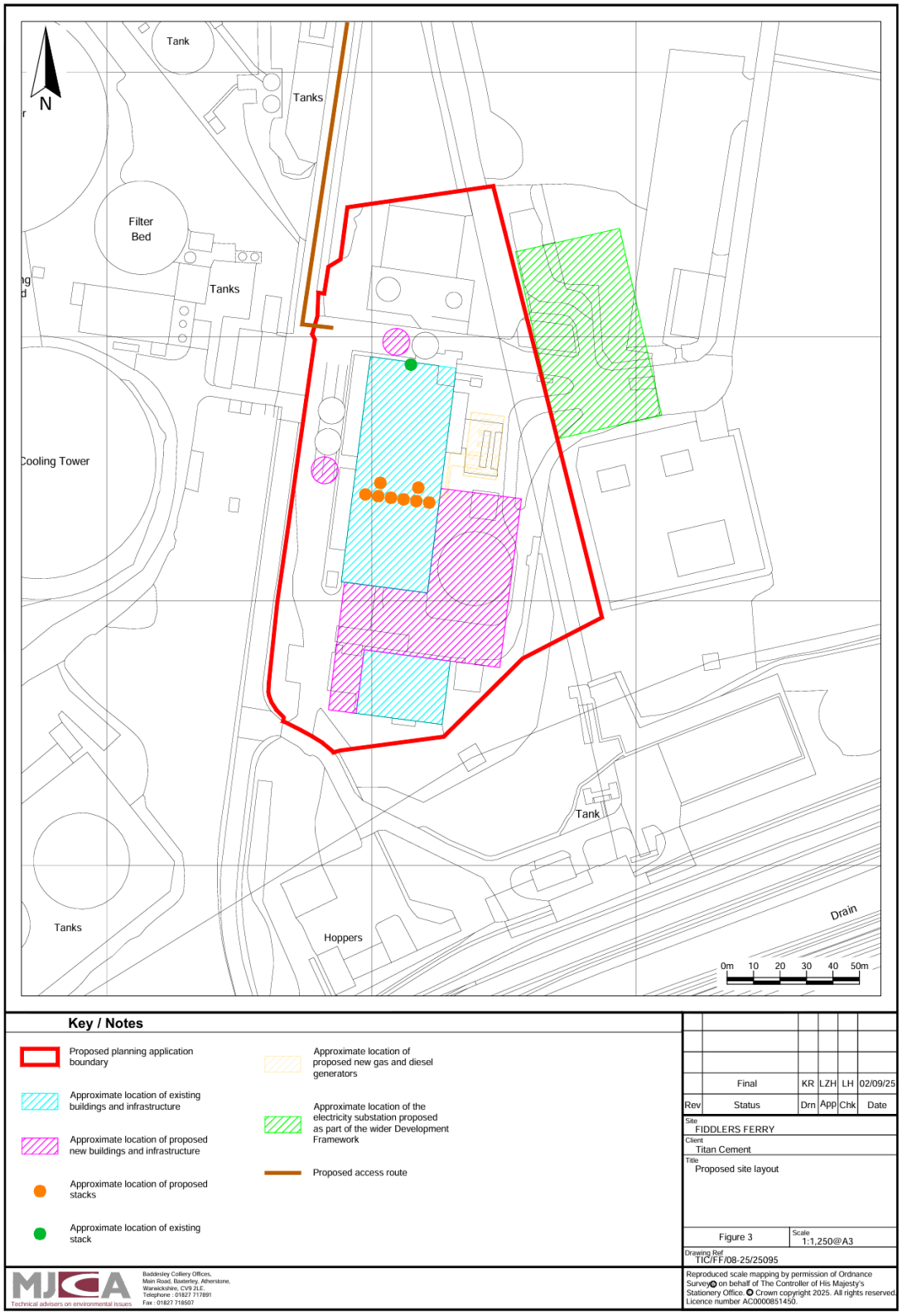


FIGURE 4

Illustrative Site Layout with Proposed Extended Storage and Additional Plant

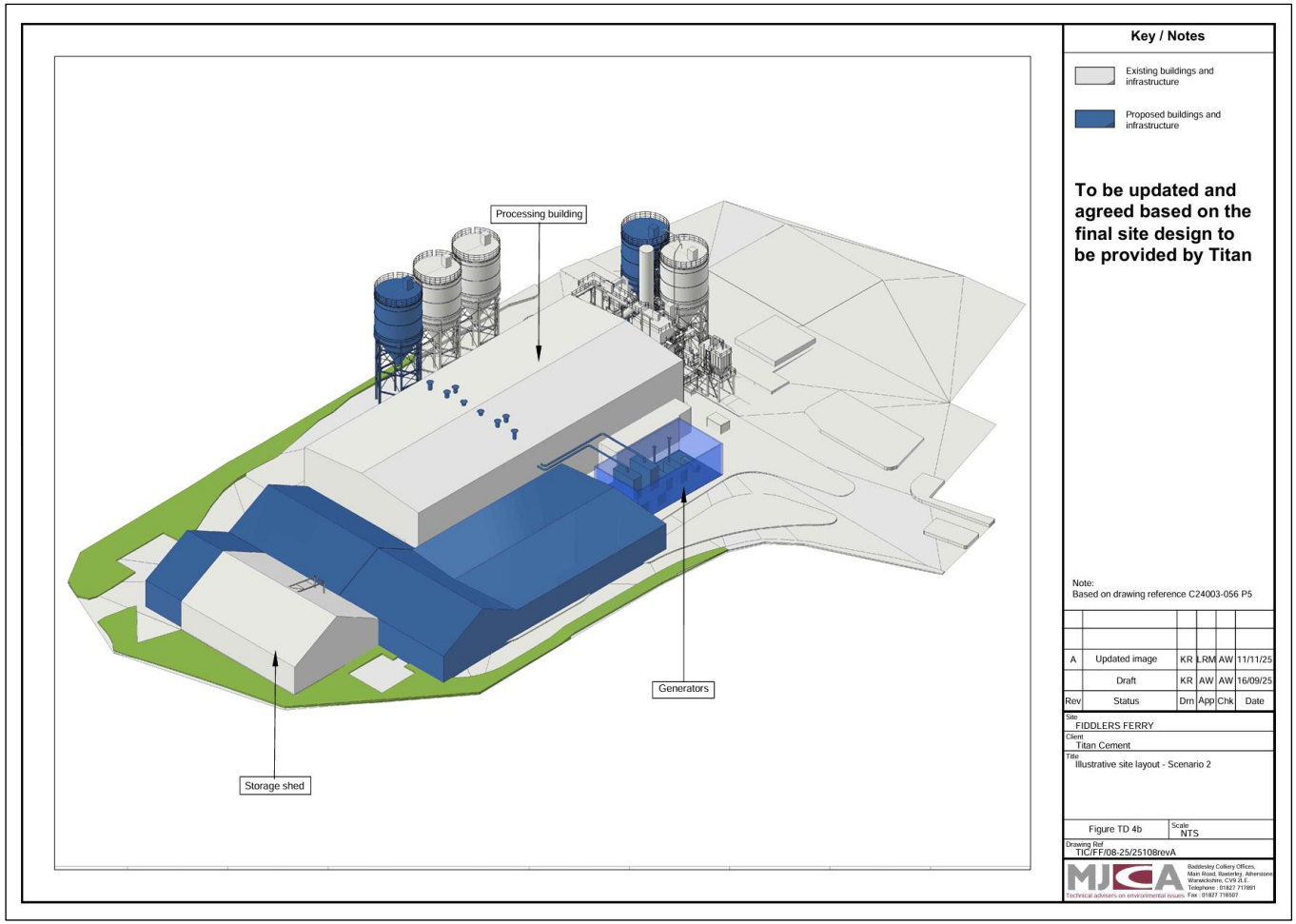
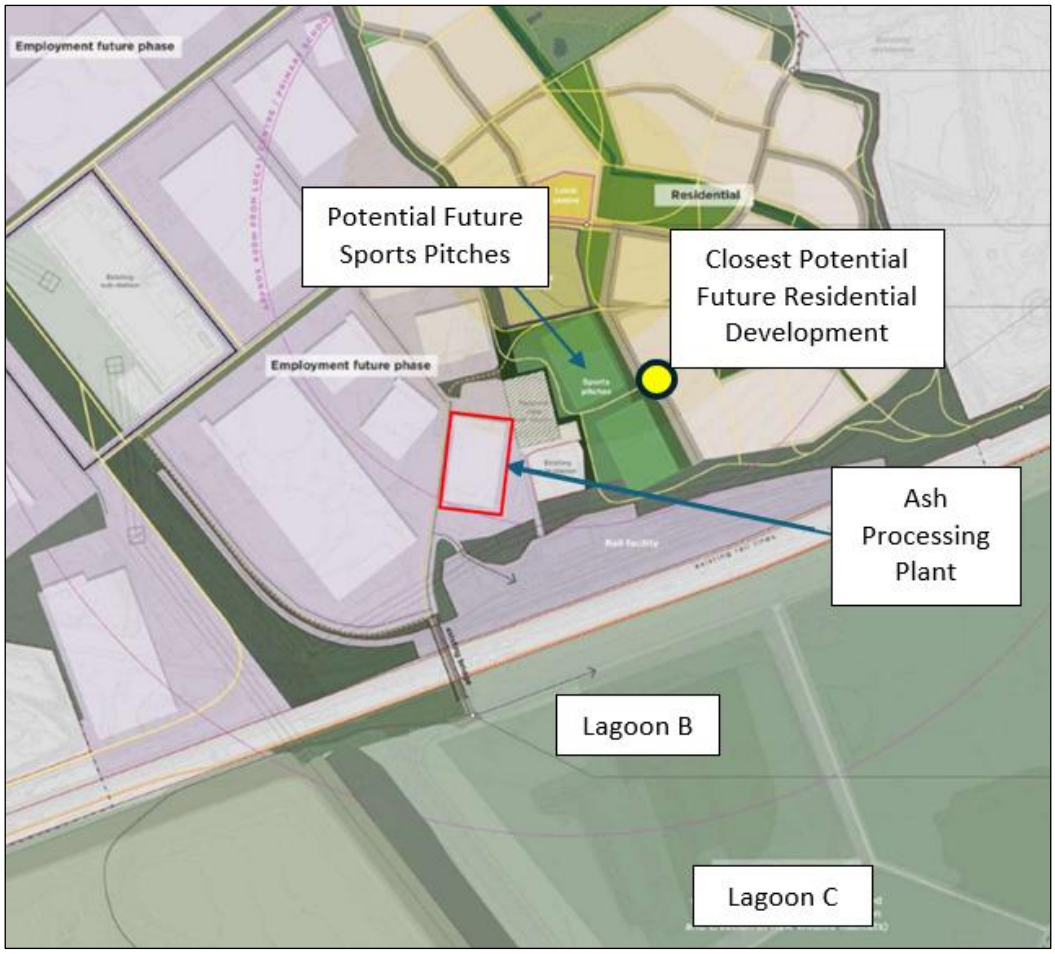


FIGURE 5

Assessment Locations

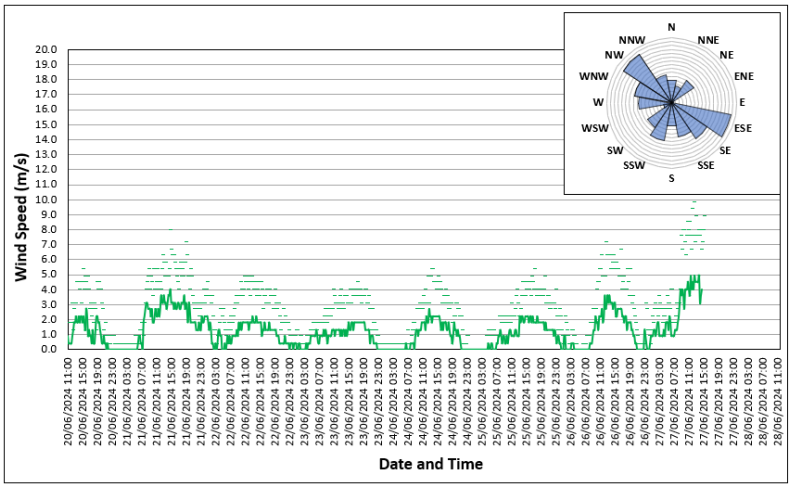


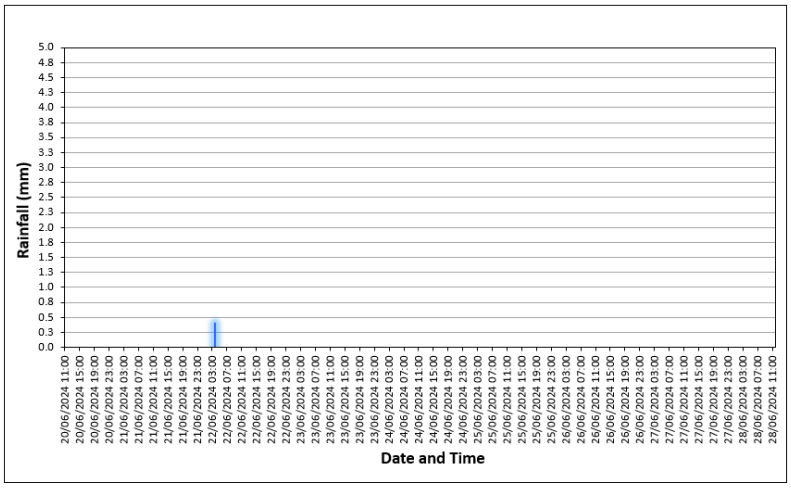
Receptors	Type	Floor	Coordinates (m)		
			X	Y	Z
Potential Future Residential Development	Residential	GF	354937.0	386182.9	17.5
		FF	354937.0	386182.9	20.0
Proposed Sports Pitches (West)	Recreation	n/a	354851.3	386104.3	15.9
Proposed Sports Pitches (East)	Recreation	n/a	354950.7	386125.8	16.8
FFL Lagoon B (Northern Boundary)	Ecological	n/a	354704.0	385700.9	16.5
FFL Lagoon C (Northern Boundary)	Ecological	n/a	355034.3	385371.3	15.5

Monitoring Locations	Coordinates (m)		
	X	Y	Z
Sound Level Meter and Weather Station	354985.0	386182.73	17.0

FIGURE 6

Weather Conditions





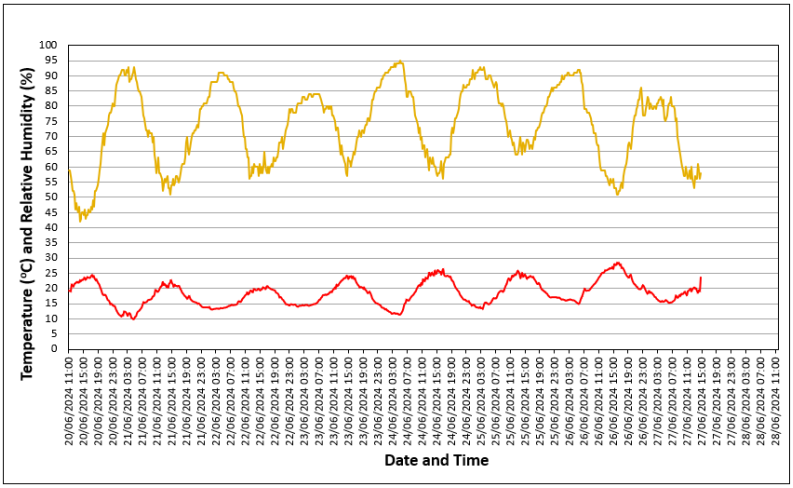
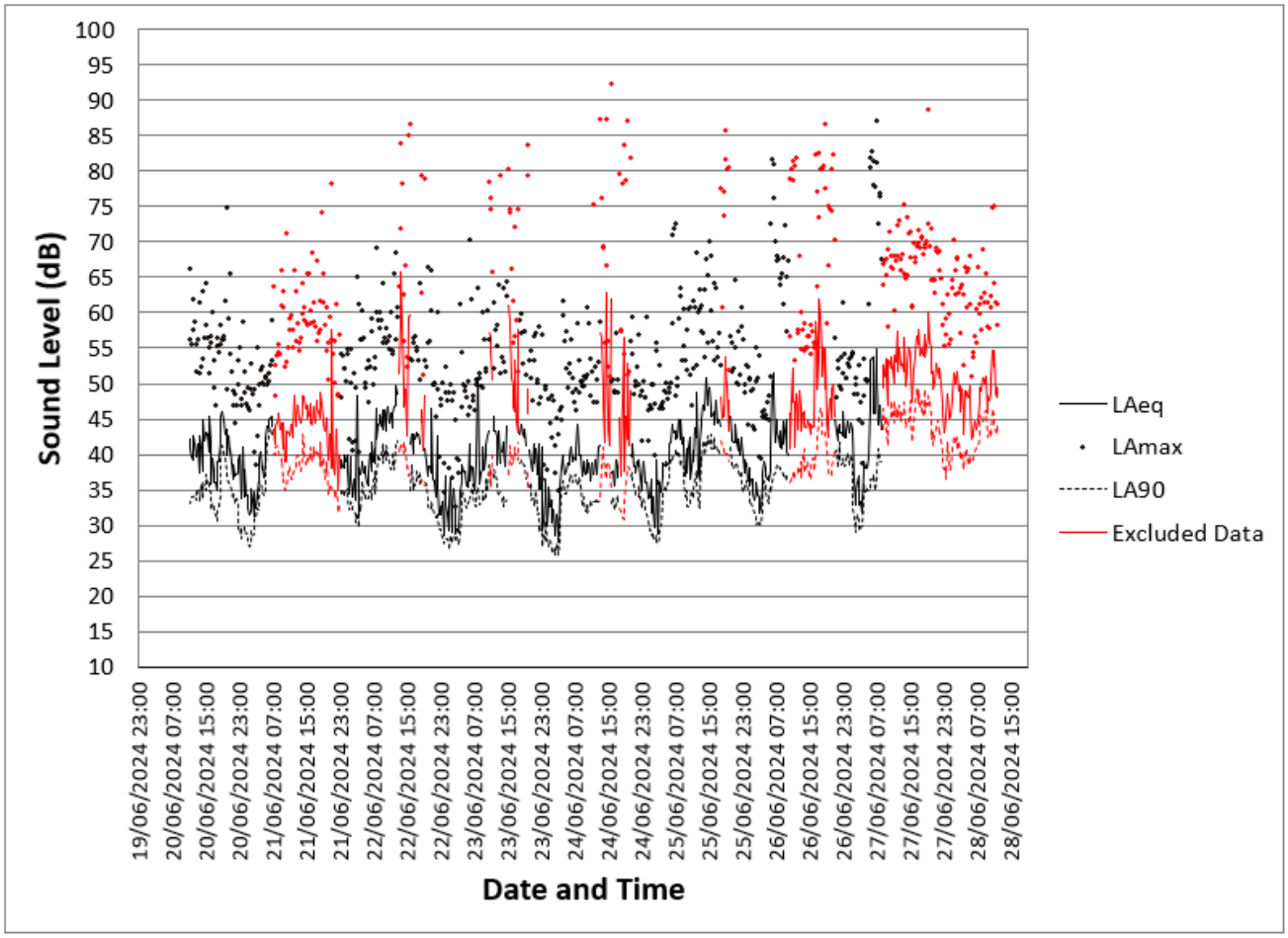


FIGURE 7

Measured Baseline Sound Levels



APPENDIX A

Terminology and Definitions

Acoustic Environment
Sound from all sound sources as modified by the environment.

Sound Power Level, L_{WA}
The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in. It is a logarithmic measure of the sound power in comparison to a specified reference level.

Equivalent continuous A-weighted sound pressure level $L_{Aeq,T}$
Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval *T*, has the same mean square sound pressure as a sound under consideration whose level varies with time.

A-weighting
The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.

Ambient Sound Level $L_{Aeq,T}$
Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

Specific Sound Level (also referred to as 'site noise') $L_{Aeq,Tr}$
Sound in the neighbourhood of a site that originates from the site i.e. the sound being assessed. The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment position over a given reference time interval.

Rating Level $L_{Ar,Tr}$
The specific sound level plus any adjustment for the characteristic features of the sound.

Residual Sound Level $L_{Aeq,T}$
Ambient sound remaining at a given position in a given situation when the specific sound source is suppressed to a degree such that it does not contribute to the ambient sound.

Background Sound Level $L_{A90,T}$
The A-weighted sound pressure level of the residual sound at the assessment position that is exceeded for 90% of a given time interval, *T*, measured using time weighting F.

Reference Time Interval, T_r
The specified interval over which the specific sound level is determined.
NOTE This is 1hr during the day (07:00-23:00) and a shorter period of 15 min at night (23:00-07:00).

Free-field Level
The sound pressure level away from reflecting surfaces.
NOTE Measurements made 1.2 - 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces are usually regarded as free-field.

APPENDIX B

Baseline Noise Monitoring Data

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
20/06/2024 11:00	42.2	33.3
20/06/2024 11:15	40.9	33.0
20/06/2024 11:30	39.7	34.1
20/06/2024 11:45	39.2	34.0
20/06/2024 12:00	42.7	34.0
20/06/2024 12:15	41.6	34.2
20/06/2024 12:30	40.0	33.5
20/06/2024 12:45	39.6	34.7
20/06/2024 13:00	41.5	35.2
20/06/2024 13:15	37.4	33.7
20/06/2024 13:30	42.6	33.4
20/06/2024 13:45	41.0	35.9
20/06/2024 14:00	37.6	33.8
20/06/2024 14:15	45.0	36.1
20/06/2024 14:30	42.0	35.3
20/06/2024 14:45	42.9	34.9
20/06/2024 15:00	43.0	37.2
20/06/2024 15:15	42.8	35.7
20/06/2024 15:30	40.3	36.0
20/06/2024 15:45	45.3	34.9
20/06/2024 16:00	42.0	34.7
20/06/2024 16:15	35.9	32.2
20/06/2024 16:30	39.5	33.0
20/06/2024 16:45	37.8	32.6
20/06/2024 17:00	36.0	31.8
20/06/2024 17:15	36.1	31.6
20/06/2024 17:30	34.9	30.5
20/06/2024 17:45	39.0	32.0
20/06/2024 18:00	39.1	32.7
20/06/2024 18:15	41.7	34.0
20/06/2024 18:30	45.3	40.1
20/06/2024 18:45	46.0	41.2
20/06/2024 19:00	44.9	40.5
20/06/2024 19:15	44.8	39.7
20/06/2024 19:30	42.9	39.5
20/06/2024 19:45	43.5	37.3
20/06/2024 20:00	39.8	36.7
20/06/2024 20:15	42.6	36.1
20/06/2024 20:30	40.1	35.8
20/06/2024 20:45	40.8	35.8

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
20/06/2024 21:00	38.7	34.6
20/06/2024 21:15	36.6	33.8
20/06/2024 21:30	38.5	34.4
20/06/2024 21:45	37.0	33.6
20/06/2024 22:00	37.2	33.0
20/06/2024 22:15	37.2	33.8
20/06/2024 22:30	37.5	33.1
20/06/2024 22:45	39.3	29.5
20/06/2024 23:00	40.0	29.7
20/06/2024 23:15	34.0	28.1
20/06/2024 23:30	33.8	29.6
20/06/2024 23:45	41.0	29.7
21/06/2024 00:00	33.9	29.7
21/06/2024 00:15	37.9	28.8
21/06/2024 00:30	34.3	29.0
21/06/2024 00:45	34.2	28.5
21/06/2024 01:00	32.5	27.7
21/06/2024 01:15	31.5	26.9
21/06/2024 01:30	32.0	27.4
21/06/2024 01:45	35.2	29.2
21/06/2024 02:00	33.6	28.5
21/06/2024 02:15	31.2	28.8
21/06/2024 02:30	34.6	31.3
21/06/2024 02:45	32.5	31.2
21/06/2024 03:00	34.0	32.4
21/06/2024 03:15	34.5	32.2
21/06/2024 03:30	36.5	32.1
21/06/2024 03:45	39.5	36.2
21/06/2024 04:00	40.3	36.1
21/06/2024 04:15	37.8	34.9
21/06/2024 04:30	38.4	34.7
21/06/2024 04:45	36.8	34.3
21/06/2024 05:00	38.9	34.8
21/06/2024 05:15	42.3	38.5
21/06/2024 05:30	44.0	41.8
21/06/2024 05:45	43.8	42.4
21/06/2024 06:00	44.8	43.4
21/06/2024 06:15	45.1	43.7
21/06/2024 06:30	45.4	42.8
21/06/2024 06:45	44.0	42.3

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
21/06/2024 07:00	43.6	40.2
21/06/2024 07:15	41.5	39.9
21/06/2024 07:30	44.0	41.1
21/06/2024 07:45	44.5	41.3
21/06/2024 08:00	45.2	41.0
21/06/2024 08:15	45.8	40.3
21/06/2024 08:30	43.5	39.6
21/06/2024 08:45	43.7	39.0
21/06/2024 09:00	44.5	39.4
21/06/2024 09:15	40.9	36.3
21/06/2024 09:30	44.5	36.4
21/06/2024 09:45	39.0	35.0
21/06/2024 10:00	38.9	35.3
21/06/2024 10:15	43.4	35.3
21/06/2024 10:30	43.0	37.4
21/06/2024 10:45	42.8	38.2
21/06/2024 11:00	42.7	37.6
21/06/2024 11:15	44.1	36.6
21/06/2024 11:30	42.3	36.5
21/06/2024 11:45	43.6	37.2
21/06/2024 12:00	48.3	37.9
21/06/2024 12:15	44.0	37.9
21/06/2024 12:30	45.2	39.5
21/06/2024 12:45	47.0	40.0
21/06/2024 13:00	45.2	39.3
21/06/2024 13:15	45.1	38.5
21/06/2024 13:30	44.5	37.7
21/06/2024 13:45	45.9	39.5
21/06/2024 14:00	48.3	42.8
21/06/2024 14:15	48.1	41.8
21/06/2024 14:30	47.8	40.2
21/06/2024 14:45	46.5	38.5
21/06/2024 15:00	47.0	39.4
21/06/2024 15:15	45.2	39.1
21/06/2024 15:30	45.6	38.7
21/06/2024 15:45	47.1	41.0
21/06/2024 16:00	44.4	39.4
21/06/2024 16:15	44.1	39.1
21/06/2024 16:30	46.6	41.0
21/06/2024 16:45	45.9	39.6
21/06/2024 17:00	44.4	40.3
21/06/2024 17:15	47.6	40.1
21/06/2024 17:30	46.5	40.5
21/06/2024 17:45	46.0	40.3

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
21/06/2024 18:00	45.2	38.4
21/06/2024 18:15	48.7	41.7
21/06/2024 18:30	47.2	38.4
21/06/2024 18:45	45.2	38.5
21/06/2024 19:00	44.2	39.7
21/06/2024 19:15	43.2	36.4
21/06/2024 19:30	44.8	38.4
21/06/2024 19:45	45.2	39.1
21/06/2024 20:00	39.2	34.7
21/06/2024 20:15	39.5	34.2
21/06/2024 20:30	42.9	35.7
21/06/2024 20:45	38.1	35.1
21/06/2024 21:00	57.5	35.2
21/06/2024 21:15	38.2	35.4
21/06/2024 21:30	37.4	34.7
21/06/2024 21:45	37.1	33.7
21/06/2024 22:00	43.6	34.7
21/06/2024 22:15	36.6	33.2
21/06/2024 22:30	34.9	31.8
21/06/2024 22:45	39.9	32.6
21/06/2024 23:00	38.0	34.9
21/06/2024 23:15	39.2	34.4
21/06/2024 23:30	38.2	35.0
21/06/2024 23:45	38.0	33.9
22/06/2024 00:00	40.0	35.0
22/06/2024 00:15	39.0	34.6
22/06/2024 00:30	39.8	35.1
22/06/2024 00:45	37.7	33.8
22/06/2024 01:00	34.4	32.2
22/06/2024 01:15	39.7	33.1
22/06/2024 01:30	36.5	33.2
22/06/2024 01:45	34.8	32.8
22/06/2024 02:00	33.9	32.1
22/06/2024 02:15	36.5	32.1
22/06/2024 02:30	33.5	31.6
22/06/2024 02:45	34.4	30.3
22/06/2024 03:00	48.4	31.7
22/06/2024 03:15	31.5	29.6
22/06/2024 03:30	38.0	32.8
22/06/2024 03:45	37.2	32.0
22/06/2024 04:00	38.6	35.9
22/06/2024 04:15	38.9	36.2
22/06/2024 04:30	37.5	34.6
22/06/2024 04:45	38.2	33.8

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
22/06/2024 05:00	37.5	34.2
22/06/2024 05:15	36.0	33.7
22/06/2024 05:30	35.6	33.7
22/06/2024 05:45	37.6	34.3
22/06/2024 06:00	40.2	35.0
22/06/2024 06:15	37.6	33.5
22/06/2024 06:30	41.8	34.6
22/06/2024 06:45	39.1	36.1
22/06/2024 07:00	40.9	37.6
22/06/2024 07:15	38.8	34.5
22/06/2024 07:30	46.4	36.3
22/06/2024 07:45	42.2	37.2
22/06/2024 08:00	44.3	40.0
22/06/2024 08:15	44.4	39.3
22/06/2024 08:30	45.5	39.6
22/06/2024 08:45	44.0	39.9
22/06/2024 09:00	46.3	41.4
22/06/2024 09:15	43.6	38.8
22/06/2024 09:30	46.3	40.5
22/06/2024 09:45	43.4	39.2
22/06/2024 10:00	45.6	41.2
22/06/2024 10:15	46.7	40.1
22/06/2024 10:30	44.4	38.7
22/06/2024 10:45	44.4	38.5
22/06/2024 11:00	45.8	37.9
22/06/2024 11:15	43.8	38.2
22/06/2024 11:30	45.7	40.4
22/06/2024 11:45	46.8	37.9
22/06/2024 12:00	46.9	41.2
22/06/2024 12:15	49.7	41.3
22/06/2024 12:30	48.6	42.0
22/06/2024 12:45	48.8	41.8
22/06/2024 13:00	51.5	40.3
22/06/2024 13:15	58.2	41.4
22/06/2024 13:30	65.7	41.1
22/06/2024 13:45	58.2	41.3
22/06/2024 14:00	49.6	40.2
22/06/2024 14:15	46.8	41.8
22/06/2024 14:30	49.2	40.5
22/06/2024 14:45	43.2	38.1
22/06/2024 15:00	42.6	38.8
22/06/2024 15:15	59.4	37.0
22/06/2024 15:30	59.7	37.8
22/06/2024 15:45	41.5	34.8

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
22/06/2024 16:00	42.9	38.6
22/06/2024 16:15	40.2	34.8
22/06/2024 16:30	42.8	36.1
22/06/2024 16:45	42.1	35.5
22/06/2024 17:00	43.1	36.5
22/06/2024 17:15	42.6	37.7
22/06/2024 17:30	42.8	36.8
22/06/2024 17:45	41.9	37.5
22/06/2024 18:00	41.5	35.9
22/06/2024 18:15	44.7	36.1
22/06/2024 18:30	46.3	36.4
22/06/2024 18:45	40.6	35.8
22/06/2024 19:00	48.2	35.5
22/06/2024 19:15	40.8	36.1
22/06/2024 19:30	38.9	35.8
22/06/2024 19:45	37.0	33.5
22/06/2024 20:00	38.2	32.7
22/06/2024 20:15	38.3	32.1
22/06/2024 20:30	37.4	32.4
22/06/2024 20:45	46.4	33.2
22/06/2024 21:00	36.6	32.4
22/06/2024 21:15	36.3	31.5
22/06/2024 21:30	36.0	31.5
22/06/2024 21:45	34.0	31.1
22/06/2024 22:00	42.7	31.8
22/06/2024 22:15	35.4	31.1
22/06/2024 22:30	31.4	29.5
22/06/2024 22:45	32.6	29.5
22/06/2024 23:00	31.6	29.1
22/06/2024 23:15	33.4	28.3
22/06/2024 23:30	28.9	27.5
22/06/2024 23:45	28.5	27.6
23/06/2024 00:00	36.9	27.9
23/06/2024 00:15	32.9	28.1
23/06/2024 00:30	31.8	28.0
23/06/2024 00:45	29.3	27.4
23/06/2024 01:00	32.9	26.6
23/06/2024 01:15	36.4	28.6
23/06/2024 01:30	29.1	27.4
23/06/2024 01:45	32.8	28.1
23/06/2024 02:00	35.2	28.5
23/06/2024 02:15	32.2	28.1
23/06/2024 02:30	28.7	27.7
23/06/2024 02:45	29.5	28.4

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
23/06/2024 03:00	29.1	28.0
23/06/2024 03:15	28.9	27.2
23/06/2024 03:30	34.6	29.0
23/06/2024 03:45	36.1	31.4
23/06/2024 04:00	38.5	34.8
23/06/2024 04:15	37.6	34.2
23/06/2024 04:30	37.3	33.5
23/06/2024 04:45	37.7	33.2
23/06/2024 05:00	35.5	32.5
23/06/2024 05:15	36.1	32.8
23/06/2024 05:30	35.4	33.1
23/06/2024 05:45	41.5	33.9
23/06/2024 06:00	36.2	33.8
23/06/2024 06:15	38.2	34.8
23/06/2024 06:30	38.0	35.9
23/06/2024 06:45	37.8	34.3
23/06/2024 07:00	35.0	32.8
23/06/2024 07:15	38.6	32.7
23/06/2024 07:30	39.3	34.5
23/06/2024 07:45	50.7	35.3
23/06/2024 08:00	38.2	33.3
23/06/2024 08:15	35.8	32.9
23/06/2024 08:30	37.4	33.2
23/06/2024 08:45	37.9	33.6
23/06/2024 09:00	41.1	35.0
23/06/2024 09:15	37.9	33.5
23/06/2024 09:30	39.6	34.0
23/06/2024 09:45	41.3	36.6
23/06/2024 10:00	42.7	34.8
23/06/2024 10:15	43.3	38.5
23/06/2024 10:30	57.3	37.0
23/06/2024 10:45	56.6	38.1
23/06/2024 11:00	54.6	35.4
23/06/2024 11:15	50.6	39.9
23/06/2024 11:30	45.3	36.8
23/06/2024 11:45	43.3	37.9
23/06/2024 12:00	43.3	37.2
23/06/2024 12:15	42.6	36.2
23/06/2024 12:30	38.6	35.1
23/06/2024 12:45	43.3	34.2
23/06/2024 13:00	38.7	34.6
23/06/2024 13:15	56.2	34.1
23/06/2024 13:30	40.4	33.8
23/06/2024 13:45	41.8	32.7

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
23/06/2024 14:00	40.7	34.1
23/06/2024 14:15	38.2	33.2
23/06/2024 14:30	43.8	33.6
23/06/2024 14:45	44.0	33.6
23/06/2024 15:00	61.3	37.2
23/06/2024 15:15	59.0	40.0
23/06/2024 15:30	58.4	41.3
23/06/2024 15:45	50.8	38.5
23/06/2024 16:00	49.8	38.9
23/06/2024 16:15	46.6	38.8
23/06/2024 16:30	46.1	41.0
23/06/2024 16:45	53.3	39.8
23/06/2024 17:00	44.7	40.2
23/06/2024 17:15	43.1	39.3
23/06/2024 17:30	57.6	41.8
23/06/2024 17:45	42.9	38.7
23/06/2024 18:00	44.1	39.1
23/06/2024 18:15	44.2	39.2
23/06/2024 18:30	42.8	38.8
23/06/2024 18:45	42.4	38.4
23/06/2024 19:00	43.5	38.2
23/06/2024 19:15	41.2	36.6
23/06/2024 19:30	45.8	37.4
23/06/2024 19:45	49.2	35.3
23/06/2024 20:00	40.5	35.3
23/06/2024 20:15	39.1	36.0
23/06/2024 20:30	38.7	33.6
23/06/2024 20:45	37.6	33.8
23/06/2024 21:00	41.4	33.7
23/06/2024 21:15	38.8	32.6
23/06/2024 21:30	40.8	34.8
23/06/2024 21:45	37.7	32.5
23/06/2024 22:00	37.2	31.5
23/06/2024 22:15	41.6	31.8
23/06/2024 22:30	35.2	28.9
23/06/2024 22:45	35.2	29.7
23/06/2024 23:00	41.1	30.5
23/06/2024 23:15	29.3	26.9
23/06/2024 23:30	30.5	28.5
23/06/2024 23:45	33.8	27.8
24/06/2024 00:00	36.6	30.5
24/06/2024 00:15	29.9	28.0
24/06/2024 00:30	32.7	27.0
24/06/2024 00:45	35.4	27.3

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
24/06/2024 01:00	32.6	27.9
24/06/2024 01:15	33.6	26.8
24/06/2024 01:30	30.3	26.0
24/06/2024 01:45	32.1	26.3
24/06/2024 02:00	29.3	26.8
24/06/2024 02:15	28.5	25.9
24/06/2024 02:30	31.5	27.4
24/06/2024 02:45	29.8	26.7
24/06/2024 03:00	27.6	25.8
24/06/2024 03:15	33.5	27.9
24/06/2024 03:30	35.3	30.3
24/06/2024 03:45	38.0	35.2
24/06/2024 04:00	39.9	36.3
24/06/2024 04:15	38.9	36.3
24/06/2024 04:30	37.1	34.5
24/06/2024 04:45	37.7	34.4
24/06/2024 05:00	37.7	35.0
24/06/2024 05:15	38.8	35.5
24/06/2024 05:30	38.5	35.8
24/06/2024 05:45	39.8	37.1
24/06/2024 06:00	41.0	37.0
24/06/2024 06:15	39.1	36.0
24/06/2024 06:30	39.7	36.3
24/06/2024 06:45	39.4	37.0
24/06/2024 07:00	39.3	37.1
24/06/2024 07:15	40.5	36.6
24/06/2024 07:30	44.1	35.5
24/06/2024 07:45	40.8	36.6
24/06/2024 08:00	40.0	36.7
24/06/2024 08:15	40.0	35.5
24/06/2024 08:30	37.1	32.7
24/06/2024 08:45	36.9	33.4
24/06/2024 09:00	39.0	34.0
24/06/2024 09:15	37.8	33.2
24/06/2024 09:30	37.2	32.0
24/06/2024 09:45	39.2	32.9
24/06/2024 10:00	37.5	31.8
24/06/2024 10:15	38.7	32.4
24/06/2024 10:30	37.0	33.1
24/06/2024 10:45	36.2	33.5
24/06/2024 11:00	38.8	32.6
24/06/2024 11:15	50.7	34.3
24/06/2024 11:30	37.2	33.3
24/06/2024 11:45	39.2	33.2

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
24/06/2024 12:00	37.4	33.8
24/06/2024 12:15	37.1	33.3
24/06/2024 12:30	41.0	33.2
24/06/2024 12:45	41.3	33.5
24/06/2024 13:00	57.4	34.0
24/06/2024 13:15	56.5	38.6
24/06/2024 13:30	49.7	41.1
24/06/2024 13:45	47.0	39.6
24/06/2024 14:00	41.7	37.6
24/06/2024 14:15	62.8	36.6
24/06/2024 14:30	54.5	38.6
24/06/2024 14:45	46.2	38.8
24/06/2024 15:00	43.6	38.9
24/06/2024 15:15	41.2	37.8
24/06/2024 15:30	62.0	35.0
24/06/2024 15:45	37.5	33.0
24/06/2024 16:00	37.6	34.0
24/06/2024 16:15	35.5	32.1
24/06/2024 16:30	35.5	32.1
24/06/2024 16:45	39.3	33.0
24/06/2024 17:00	38.3	34.3
24/06/2024 17:15	36.7	33.0
24/06/2024 17:30	45.2	32.3
24/06/2024 17:45	37.0	32.0
24/06/2024 18:00	39.1	31.9
24/06/2024 18:15	47.1	31.0
24/06/2024 18:30	56.5	30.9
24/06/2024 18:45	37.6	33.6
24/06/2024 19:00	45.4	35.6
24/06/2024 19:15	42.1	38.4
24/06/2024 19:30	52.8	38.2
24/06/2024 19:45	41.3	38.0
24/06/2024 20:00	49.0	37.4
24/06/2024 20:15	40.0	37.0
24/06/2024 20:30	39.6	37.5
24/06/2024 20:45	41.5	36.5
24/06/2024 21:00	38.4	35.6
24/06/2024 21:15	38.3	34.8
24/06/2024 21:30	37.5	34.2
24/06/2024 21:45	39.0	34.1
24/06/2024 22:00	38.4	34.1
24/06/2024 22:15	39.3	35.5
24/06/2024 22:30	36.8	34.1
24/06/2024 22:45	35.0	32.5

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
24/06/2024 23:00	36.5	33.3
24/06/2024 23:15	39.0	33.7
24/06/2024 23:30	36.6	32.6
24/06/2024 23:45	36.1	31.9
25/06/2024 00:00	36.1	31.4
25/06/2024 00:15	34.2	30.9
25/06/2024 00:30	33.8	30.7
25/06/2024 00:45	33.9	29.2
25/06/2024 01:00	36.4	29.2
25/06/2024 01:15	31.8	28.6
25/06/2024 01:30	34.0	29.0
25/06/2024 01:45	32.2	28.2
25/06/2024 02:00	29.7	27.8
25/06/2024 02:15	34.8	28.6
25/06/2024 02:30	39.3	27.7
25/06/2024 02:45	28.7	27.4
25/06/2024 03:00	35.9	28.4
25/06/2024 03:15	35.7	29.7
25/06/2024 03:30	34.7	30.0
25/06/2024 03:45	37.0	33.8
25/06/2024 04:00	38.8	35.0
25/06/2024 04:15	38.6	35.1
25/06/2024 04:30	38.2	35.6
25/06/2024 04:45	38.9	35.0
25/06/2024 05:00	38.6	35.7
25/06/2024 05:15	38.7	36.4
25/06/2024 05:30	41.6	38.3
25/06/2024 05:45	41.8	39.3
25/06/2024 06:00	44.3	39.1
25/06/2024 06:15	43.7	39.5
25/06/2024 06:30	43.1	40.1
25/06/2024 06:45	43.4	40.2
25/06/2024 07:00	42.1	40.6
25/06/2024 07:15	42.5	40.5
25/06/2024 07:30	42.7	40.0
25/06/2024 07:45	44.9	40.4
25/06/2024 08:00	42.1	38.3
25/06/2024 08:15	44.8	38.7
25/06/2024 08:30	41.6	39.0
25/06/2024 08:45	42.3	37.8
25/06/2024 09:00	40.6	36.5
25/06/2024 09:15	37.0	34.0
25/06/2024 09:30	40.7	34.8
25/06/2024 09:45	37.4	32.7

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
25/06/2024 10:00	41.1	32.6
25/06/2024 10:15	42.4	32.8
25/06/2024 10:30	36.6	33.7
25/06/2024 10:45	38.0	34.8
25/06/2024 11:00	40.6	33.8
25/06/2024 11:15	39.1	34.9
25/06/2024 11:30	43.7	36.8
25/06/2024 11:45	42.4	37.7
25/06/2024 12:00	48.7	36.0
25/06/2024 12:15	37.1	33.2
25/06/2024 12:30	36.5	32.4
25/06/2024 12:45	41.8	34.0
25/06/2024 13:00	44.1	39.7
25/06/2024 13:15	44.9	38.9
25/06/2024 13:30	46.9	42.0
25/06/2024 13:45	46.3	41.5
25/06/2024 14:00	46.4	40.0
25/06/2024 14:15	50.7	41.4
25/06/2024 14:30	47.0	42.6
25/06/2024 14:45	48.8	41.2
25/06/2024 15:00	49.5	41.4
25/06/2024 15:15	46.8	42.9
25/06/2024 15:30	45.4	40.9
25/06/2024 15:45	45.6	40.7
25/06/2024 16:00	46.0	42.5
25/06/2024 16:15	44.3	40.9
25/06/2024 16:30	47.7	41.3
25/06/2024 16:45	44.4	40.5
25/06/2024 17:00	44.4	40.7
25/06/2024 17:15	44.9	40.3
25/06/2024 17:30	43.9	39.7
25/06/2024 17:45	48.2	42.0
25/06/2024 18:00	45.2	41.3
25/06/2024 18:15	46.8	41.2
25/06/2024 18:30	45.3	39.9
25/06/2024 18:45	53.8	40.0
25/06/2024 19:00	52.0	40.1
25/06/2024 19:15	49.7	40.1
25/06/2024 19:30	43.2	39.7
25/06/2024 19:45	47.7	39.0
25/06/2024 20:00	45.6	41.1
25/06/2024 20:15	42.6	38.6
25/06/2024 20:30	42.0	38.0
25/06/2024 20:45	41.7	38.0

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
25/06/2024 21:00	41.7	38.5
25/06/2024 21:15	44.3	38.8
25/06/2024 21:30	41.8	38.7
25/06/2024 21:45	40.6	37.5
25/06/2024 22:00	42.2	37.8
25/06/2024 22:15	40.0	36.9
25/06/2024 22:30	42.4	37.4
25/06/2024 22:45	41.7	35.5
25/06/2024 23:00	39.6	34.7
25/06/2024 23:15	37.4	35.5
25/06/2024 23:30	39.2	35.6
25/06/2024 23:45	38.3	35.5
26/06/2024 00:00	38.8	36.3
26/06/2024 00:15	36.2	34.9
26/06/2024 00:30	38.1	35.0
26/06/2024 00:45	35.5	32.8
26/06/2024 01:00	36.4	33.0
26/06/2024 01:15	36.6	32.3
26/06/2024 01:30	34.5	32.3
26/06/2024 01:45	33.6	31.7
26/06/2024 02:00	34.6	31.4
26/06/2024 02:15	36.1	30.2
26/06/2024 02:30	34.2	30.3
26/06/2024 02:45	33.9	29.8
26/06/2024 03:00	31.7	30.4
26/06/2024 03:15	32.3	30.2
26/06/2024 03:30	35.6	32.0
26/06/2024 03:45	37.3	33.9
26/06/2024 04:00	39.0	36.2
26/06/2024 04:15	38.0	35.7
26/06/2024 04:30	37.0	34.6
26/06/2024 04:45	36.5	33.6
26/06/2024 05:00	36.9	33.0
26/06/2024 05:15	36.2	34.0
26/06/2024 05:30	37.7	35.5
26/06/2024 05:45	40.8	34.7
26/06/2024 06:00	50.0	36.3
26/06/2024 06:15	51.5	36.7
26/06/2024 06:30	48.8	37.2
26/06/2024 06:45	41.8	37.5
26/06/2024 07:00	44.8	38.5
26/06/2024 07:15	43.0	38.4
26/06/2024 07:30	42.4	38.4
26/06/2024 07:45	41.0	38.1

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
26/06/2024 08:00	43.2	37.9
26/06/2024 08:15	40.7	37.6
26/06/2024 08:30	44.6	37.1
26/06/2024 08:45	41.4	37.0
26/06/2024 09:00	43.2	37.1
26/06/2024 09:15	45.0	36.3
26/06/2024 09:30	40.3	36.9
26/06/2024 09:45	39.9	36.3
26/06/2024 10:00	46.0	36.0
26/06/2024 10:15	40.8	36.1
26/06/2024 10:30	47.6	36.4
26/06/2024 10:45	52.1	37.4
26/06/2024 11:00	47.3	36.7
26/06/2024 11:15	47.5	36.4
26/06/2024 11:30	41.0	37.5
26/06/2024 11:45	48.5	37.7
26/06/2024 12:00	46.0	37.5
26/06/2024 12:15	43.5	38.3
26/06/2024 12:30	49.0	37.6
26/06/2024 12:45	46.6	39.0
26/06/2024 13:00	43.3	36.7
26/06/2024 13:15	45.9	39.7
26/06/2024 13:30	46.1	40.7
26/06/2024 13:45	43.9	37.5
26/06/2024 14:00	43.8	38.3
26/06/2024 14:15	44.5	38.5
26/06/2024 14:30	45.0	38.9
26/06/2024 14:45	44.1	37.0
26/06/2024 15:00	42.8	36.4
26/06/2024 15:15	44.3	38.3
26/06/2024 15:30	43.8	39.4
26/06/2024 15:45	44.3	39.5
26/06/2024 16:00	44.0	37.7
26/06/2024 16:15	58.8	39.6
26/06/2024 16:30	55.7	40.9
26/06/2024 16:45	49.2	42.4
26/06/2024 17:00	53.6	44.6
26/06/2024 17:15	62.0	45.1
26/06/2024 17:30	59.7	46.5
26/06/2024 17:45	54.0	46.5
26/06/2024 18:00	51.0	42.9
26/06/2024 18:15	55.2	43.3
26/06/2024 18:30	49.3	43.3
26/06/2024 18:45	54.9	42.9

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
26/06/2024 19:00	44.4	40.7
26/06/2024 19:15	42.5	37.6
26/06/2024 19:30	45.1	37.5
26/06/2024 19:45	47.8	37.0
26/06/2024 20:00	45.1	37.0
26/06/2024 20:15	49.1	38.2
26/06/2024 20:30	49.8	39.2
26/06/2024 20:45	45.4	40.5
26/06/2024 21:00	45.1	40.4
26/06/2024 21:15	43.3	40.6
26/06/2024 21:30	41.9	38.1
26/06/2024 21:45	43.6	38.7
26/06/2024 22:00	44.3	41.8
26/06/2024 22:15	43.0	39.4
26/06/2024 22:30	43.0	38.5
26/06/2024 22:45	42.7	38.7
26/06/2024 23:00	46.0	39.4
26/06/2024 23:15	42.4	38.4
26/06/2024 23:30	42.4	38.7
26/06/2024 23:45	43.3	39.4
27/06/2024 00:00	44.6	40.1
27/06/2024 00:15	43.0	38.6
27/06/2024 00:30	43.1	38.5
27/06/2024 00:45	44.4	39.8
27/06/2024 01:00	43.6	39.3
27/06/2024 01:15	43.2	32.5
27/06/2024 01:30	36.2	31.2
27/06/2024 01:45	32.8	29.1
27/06/2024 02:00	35.0	30.3
27/06/2024 02:15	36.0	31.6
27/06/2024 02:30	36.9	30.5
27/06/2024 02:45	32.9	29.2
27/06/2024 03:00	33.2	29.7
27/06/2024 03:15	31.7	30.0
27/06/2024 03:30	33.4	30.2
27/06/2024 03:45	37.3	34.0
27/06/2024 04:00	39.1	35.9
27/06/2024 04:15	38.1	34.7
27/06/2024 04:30	38.6	35.4
27/06/2024 04:45	38.0	35.0
27/06/2024 05:00	39.5	34.8
27/06/2024 05:15	46.4	34.8
27/06/2024 05:30	53.3	36.6
27/06/2024 05:45	53.5	36.6

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
27/06/2024 06:00	53.7	36.2
27/06/2024 06:15	45.8	37.1
27/06/2024 06:30	45.8	34.9
27/06/2024 06:45	54.8	36.8
27/06/2024 07:00	50.7	37.6
27/06/2024 07:15	44.2	40.9
27/06/2024 07:30	46.9	39.3
27/06/2024 07:45	46.6	38.9
27/06/2024 08:00	43.5	39.1
27/06/2024 08:15	49.5	43.5
27/06/2024 08:30	52.6	46.5
27/06/2024 08:45	51.0	44.3
27/06/2024 09:00	53.5	45.3
27/06/2024 09:15	51.3	43.0
27/06/2024 09:30	46.9	41.3
27/06/2024 09:45	53.2	44.2
27/06/2024 10:00	53.1	45.2
27/06/2024 10:15	52.1	45.4
27/06/2024 10:30	53.7	47.7
27/06/2024 10:45	51.9	45.5
27/06/2024 11:00	50.2	44.5
27/06/2024 11:15	54.0	47.3
27/06/2024 11:30	53.0	45.3
27/06/2024 11:45	57.3	46.4
27/06/2024 12:00	51.7	45.1
27/06/2024 12:15	55.1	47.0
27/06/2024 12:30	52.7	44.6
27/06/2024 12:45	53.1	46.1
27/06/2024 13:00	52.5	45.5
27/06/2024 13:15	51.7	45.3
27/06/2024 13:30	56.4	47.5
27/06/2024 13:45	49.6	43.7
27/06/2024 14:00	51.5	44.6
27/06/2024 14:15	52.8	44.9
27/06/2024 14:30	55.0	44.7
27/06/2024 14:45	54.2	47.6
27/06/2024 15:00	52.3	45.3
27/06/2024 15:15	47.6	42.2
27/06/2024 15:30	47.5	41.7
27/06/2024 15:45	52.1	44.5
27/06/2024 16:00	53.7	46.9
27/06/2024 16:15	54.5	47.1
27/06/2024 16:30	56.7	49.3
27/06/2024 16:45	55.6	47.1

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
27/06/2024 17:00	57.7	49.2
27/06/2024 17:15	54.0	46.8
27/06/2024 17:30	54.8	47.6
27/06/2024 17:45	54.4	46.3
27/06/2024 18:00	54.0	45.3
27/06/2024 18:15	56.9	49.2
27/06/2024 18:30	53.8	45.9
27/06/2024 18:45	55.3	47.6
27/06/2024 19:00	56.4	46.9
27/06/2024 19:15	60.2	48.2
27/06/2024 19:30	55.9	47.5
27/06/2024 19:45	55.0	45.4
27/06/2024 20:00	51.4	42.1
27/06/2024 20:15	51.6	43.3
27/06/2024 20:30	49.3	41.3
27/06/2024 20:45	50.2	42.8
27/06/2024 21:00	52.7	43.8
27/06/2024 21:15	52.9	44.0
27/06/2024 21:30	51.8	44.8
27/06/2024 21:45	50.9	42.9
27/06/2024 22:00	52.1	43.2
27/06/2024 22:15	50.0	42.0
27/06/2024 22:30	47.2	40.3
27/06/2024 22:45	46.1	38.2
27/06/2024 23:00	43.1	37.9
27/06/2024 23:15	45.0	38.4
27/06/2024 23:30	45.5	36.6
27/06/2024 23:45	48.5	41.7
28/06/2024 00:00	45.8	38.9
28/06/2024 00:15	45.1	37.8
28/06/2024 00:30	45.3	37.8
28/06/2024 00:45	47.9	40.6
28/06/2024 01:00	48.0	40.8
28/06/2024 01:15	51.4	42.6
28/06/2024 01:30	50.8	42.4
28/06/2024 01:45	49.8	41.5
28/06/2024 02:00	51.7	42.3
28/06/2024 02:15	51.5	40.5

Date and Time	$L_{Aeq,15min}$	$L_{A90,15min}$
28/06/2024 02:30	48.9	42.0
28/06/2024 02:45	49.6	39.5
28/06/2024 03:00	46.1	39.3
28/06/2024 03:15	49.3	40.4
28/06/2024 03:30	46.5	37.9
28/06/2024 03:45	42.9	37.9
28/06/2024 04:00	49.0	40.8
28/06/2024 04:15	48.8	40.6
28/06/2024 04:30	48.4	39.7
28/06/2024 04:45	48.1	38.5
28/06/2024 05:00	49.7	40.0
28/06/2024 05:15	47.2	38.7
28/06/2024 05:30	42.2	39.2
28/06/2024 05:45	42.6	39.2
28/06/2024 06:00	43.3	39.5
28/06/2024 06:15	44.6	40.5
28/06/2024 06:30	43.5	40.8
28/06/2024 06:45	43.7	41.3
28/06/2024 07:00	44.6	41.2
28/06/2024 07:15	47.2	42.1
28/06/2024 07:30	49.5	45.5
28/06/2024 07:45	49.0	44.9
28/06/2024 08:00	49.3	44.7
28/06/2024 08:15	50.7	44.7
28/06/2024 08:30	50.6	45.7
28/06/2024 08:45	50.0	45.8
28/06/2024 09:00	51.0	46.2
28/06/2024 09:15	45.7	42.4
28/06/2024 09:30	48.2	43.0
28/06/2024 09:45	47.6	43.4
28/06/2024 10:00	48.6	42.5
28/06/2024 10:15	50.7	42.4
28/06/2024 10:30	54.7	46.5
28/06/2024 10:45	52.4	45.4
28/06/2024 11:00	54.6	43.9
28/06/2024 11:15	48.5	43.2
28/06/2024 11:30	48.0	42.9
28/06/2024 11:45	49.4	44.3

APPENDIX C

Client Supplied Information and Noise Emission Level Data

Potential Traffic Routes

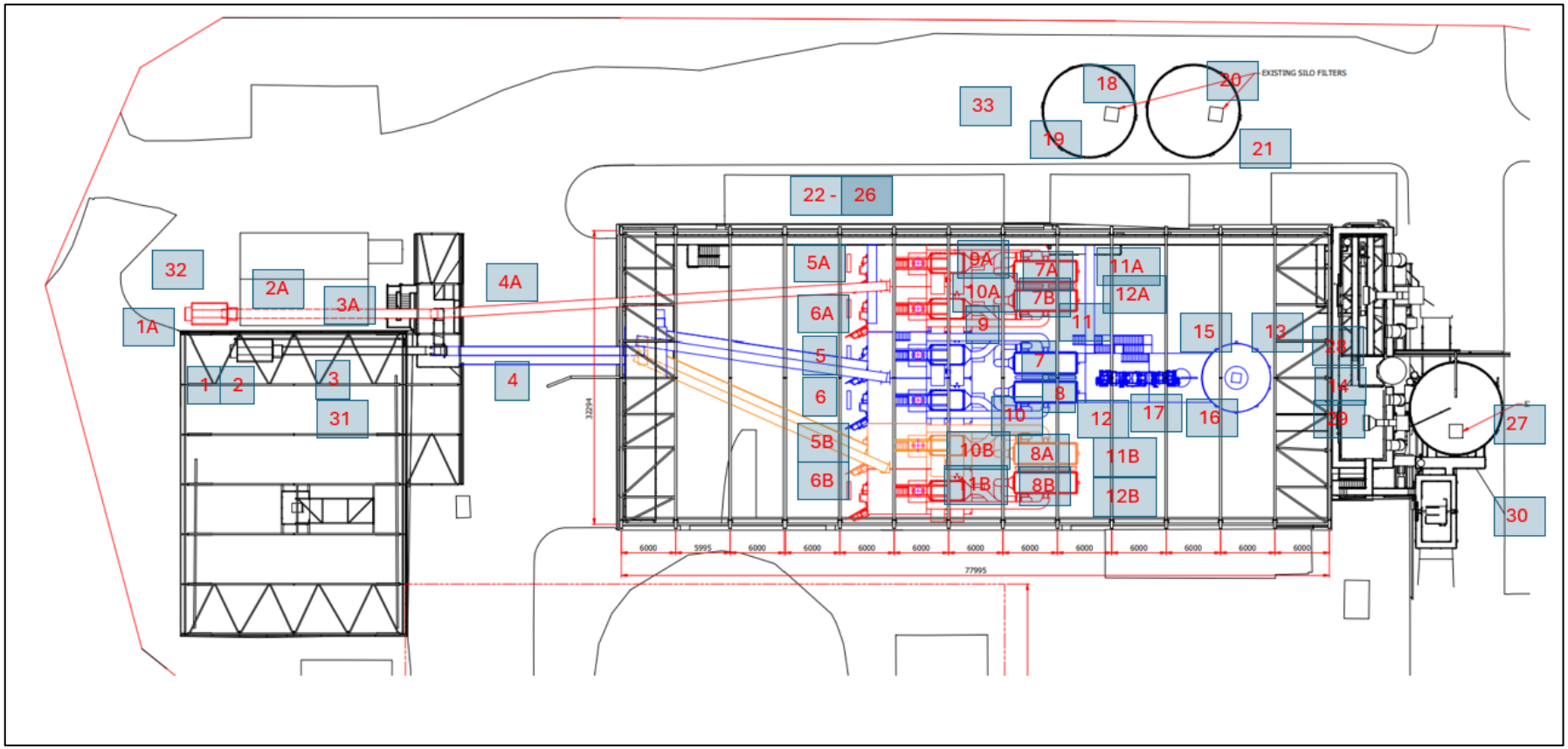
APPENDIX C (continued) – Noise Emission Data

Fiddlers Ferry
One STET F42 separator
Major Equipment

Item No.		Equipment		Vendor	Noise Level @ 1 m dba	Operation	Mon - Fri 08:00 - 16:00	Mon - Fri 8-4 10 per day	Pulsed 1/Min
1	DRF 001	Wet Ash Reclaim Hopper	Existing Canning conveyor system. 80 TPH	Canning	75	1			
2	DRS 001	Wet Ash Reclaim Hopper Screw Feeder	Existing Canning conveyor system. 80 TPH	Canning	50	1			
3	BC001	Wet Ash Conveyor 1	Existing Canning conveyor system. 80 TPH	Canning	75	1			
4	BC 002	Wet Ash Conveyor 2	New Belt Conveyor	TBD	75	1			
1A	DRF 002	Wet Ash Reclaim Hopper	Existing Canning conveyor system. 80 TPH	Canning	75	1			
2A	DRS 002	Wet Ash Reclaim Hopper Screw Feeder	Existing Canning conveyor system. 80 TPH	Canning	50	1			
3A	BC003	Wet Ash Conveyor 1	Existing Canning conveyor system. 80 TPH	Canning	75	1			
4A	BC 004	Wet Ash Conveyor 2	New Belt Conveyor	TBD	75	1			
5	ADP 001	Atritor Dryer Pulveriser	Atritor 20AE Dryer Pulveriser. Including commissioning	Atritor	85	1			
6	ADP 002	Atritor Dryer Pulveriser	Atritor 20AE Dryer Pulveriser. Including commissioning	Atritor	85	1			
5A	ADP 003	Atritor Dryer Pulveriser	Atritor 20AE Dryer Pulveriser. Including commissioning	Atritor	85	1			
6A	ADP 004	Atritor Dryer Pulveriser	Atritor 20AE Dryer Pulveriser. Including commissioning	Atritor	85	1			
5B	ADP 005	Atritor Dryer Pulveriser	Atritor 20AE Dryer Pulveriser. Including commissioning	Atritor	85	1			
6B	ADP 006	Atritor Dryer Pulveriser	Atritor 20AE Dryer Pulveriser. Including commissioning	Atritor	85	1			
7	FR 001	Dryer Filter	Bag filter sized for mill, filtering velocity 1m/min.	Atritor	85	1			1
8	FR 002	Dryer Filter	Bag filter sized for mill, filtering velocity 1m/min.	Atritor	85	1			1
7A		Dryer Filter	Bag filter sized for mill, filtering velocity 1m/min.	Atritor	85	1			
8A		Dryer Filter	Bag filter sized for mill, filtering velocity 1m/min.	Atritor	85	1			
7B		Dryer Filter	Bag filter sized for mill, filtering velocity 1m/min.	Atritor	85	1			
8B		Dryer Filter	Bag filter sized for mill, filtering velocity 1m/min.	Atritor	85	1			
9	PF 001	Process Fan	34,000 M3/hr @ 80 °C. Carbon Steel	Atritor	83	1			
10	PF 002	Process Fan	34,000 M3/hr @ 80 °C. Carbon Steel	Atritor	83	1			
9A		Process Fan	34,000 M3/hr @ 80 °C. Carbon Steel	Atritor	83	1			
10A		Process Fan	34,000 M3/hr @ 80 °C. Carbon Steel	Atritor	83	1			
9B		Process Fan	34,000 M3/hr @ 80 °C. Carbon Steel	Atritor	83	1			
10B		Process Fan	34,000 M3/hr @ 80 °C. Carbon Steel	Atritor	83	1			
11	TB 001	Transfer Blower	PD-type blower with enclosure, intake filters and relief valves 320 scfm 9.0 psig	Roots	85	1			
12	TB 002	Transfer Blower	PD-type blower with enclosure, intake filters and relief valves 320 scfm 9.0 psig	Roots	85	1			
11A		Transfer Blower	PD-type blower with enclosure, intake filters and relief valves 320 scfm 9.0 psig	Roots	85	1			
12A		Transfer Blower	PD-type blower with enclosure, intake filters and relief valves 320 scfm 9.0 psig	Roots	85	1			
11B		Transfer Blower	PD-type blower with enclosure, intake filters and relief valves 320 scfm 9.0 psig	Roots	85	1			
12B		Transfer Blower	PD-type blower with enclosure, intake filters and relief valves 320 scfm 9.0 psig	Roots	85	1			
13	FR 003	Feed Silo Filter Receiver	Capacity 1200 cfm.	TBD	85	1			1
14	TB 101	Transfer Blower	PD-type blower with enclosure, intake filters and relief valves 725 scfm 9.0 psig	IAC	85	1			
15	FR 102	Feed Hopper Filter Receiver	Filtration Capacity 1000 cfm.	TBD	85	1			1
16	FR103	Process Dust Collector	2000 CFM dust filter;. - Low Height Profile required to avoid coal conveyor interfere	TBD	85	1			1
17	ES 101	STET Separator	F42 electrostatic separator; drive motor controls	STET	80	1			
18	FR 104	ProAsh Silo 1 Vent Filter	Filtration Capacity 2500 cfm.	TBD	85	1			1
19	TB 104	Silo Aeration Blower	PD-type blower with enclosure, intake filters and relief valves 400 scfm 9.0 psig	Roots	85	1			
20	FR 105	ProAsh Silo 1 Vent Filter	Filtration Capacity 2500 cfm.	TBD	85	1			1
21	TB 105	Silo Aeration Blower	PD-type blower with enclosure, intake filters and relief valves 400 scfm 9.0 psig	Roots	85	1			
22	AC 101	Plant Air Compressor	Air Compressor in Enclosure	Ingersoll Rand	85	1			
23	AC 102	Plant Air Compressor	Air Compressor in Enclosure	Ingersoll Rand	85	1			
24	AC 103	Plant Air Compressor	Air Compressor in Enclosure	Ingersoll Rand	85	1			
25	AC 104	Plant Air Compressor	Air Compressor in Enclosure	Ingersoll Rand	85	1			
26	AC 105	Plant Air Compressor	Air Compressor in Enclosure	Ingersoll Rand	85	1			
27	FR 106	Hi Carbon Vent Filter	Filtration Capacity 2000 cfm.	TBD	85	1			1
28	TB 106	Silo Aeration Blower	PD-type blower with enclosure, intake filters and relief valves 400 scfm 9.0 psig	Roots	85	1			
29	TB 107	Transfer Blower	PD-type blower with enclosure, intake filters and relief valves 725 scfm 9.0 psig	Roots	85	1			
30	PM 101	Hi Speed Pin Mixer	Hispeed Horizontal Paddle Mixer - Scott Model 3096 or equivalent	Scott Equipmen	75			1	
	Vehicles								
31		Front End Loader	Volvo L150 H		108	1			
32		Articulated Truck	Volvo AG25		108		1		
33		Road Tanker Truck.	Articulated road tanker		78		1		

<u>Vehicle Movements:</u> The number of wet ash dumper trucks (Volvo A30 type) for full scale operation would be max 12 trucks per hour during hours of 07:00 to 17:00 on Monday to Friday. Number of dry trucks (HGV) out at full scale will be 5 trucks per hour, again 07:00 to 17:00 Monday to Friday.

APPENDIX C (continued) – Location of Existing Noise Sources

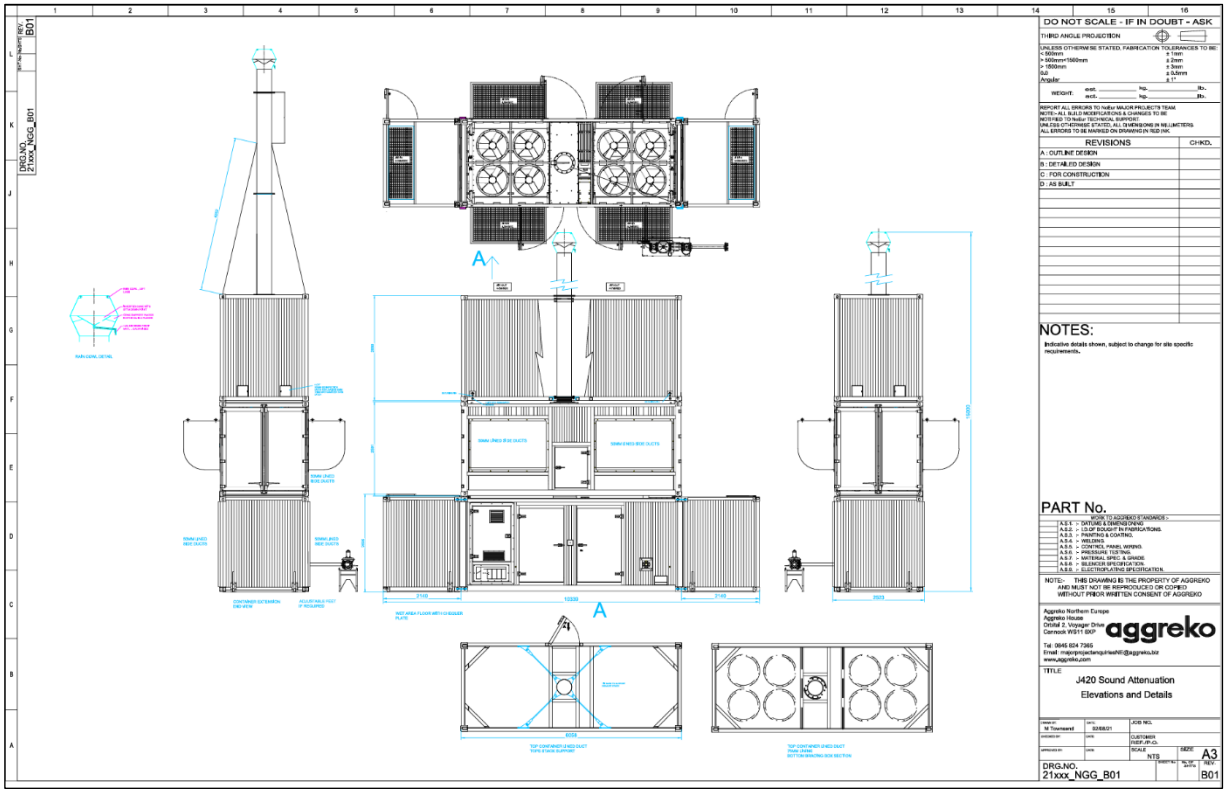


APPENDIX C (continued) – External Generator Details (Typical Example)

Diesel

SOUND POWER EEC	100
SOUND PRESSURE AT 1M	81.5 dBA
SOUND PRESSURE AT 7M	73.1 dBA

Gas



SOUND PRESSURE LEVEL AT 1M = 85 DB REDUCING TO 75 DB WITH SOUND ABATEMENT EQUIPMENT

APPENDIX C (continued) – Example of Typical Generator Compound with Acoustic Mitigation