Hillhouse IBA Processing Facility

Environmental Statement - Volume 1

Chapter 5.0 – Traffic and Transportation

Prepared for

Fortis IBA Limited

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5.0 TRAFFIC AND TRANSPORTATION

5.1 Introduction

5.1.1 This Chapter of the Environmental Statement (ES) has been prepared to consider the traffic and transport-related environmental impacts of the Proposed Development.

5.1.2 Detailed transport-related operational analysis has been considered in a formal Transport Statement (TS) (Appendix 11.1) document which is provided as a standalone document to accompany the planning application. This includes an assessment of development-related traffic forecasts, highway safety and the accessibility of the Application Site (hereafter referred to as the ‘Site’) by non-car modes of transport. The details contained within the TS are not repeated in this Chapter, however a summary of the key findings is provided.

Proposed Development

5.1.3 The proposal is for the development of an Incinerator Bottom Ash (IBA) facility on land at Hillhouse International Enterprise Zone (HIEZ), Thornton-Cleveleys, Lancashire (hereafter referred to as the ‘Proposed Development’).

5.1.4 The facility would have a maximum processing capacity of 350,000 tpa of IBA. It will take bottom ash from Energy from Waste facilities (EfWs) that accept municipal (household), commercial and industrial wastes, and process it into IBA aggregate (for use in the construction industry) and metals (for recycling at other facilities).

5.1.5 A full description of the Proposed Development is provided in Chapter 4.0 of this ES.

Competence

5.1.6 The author of this assessment has over 24 years’ experience in the field of transport planning and acts as an Associate Director within the transport planning capability of Axis. She is also a chartered member of the Institute of Logistics and Transport (CMILT) and a Member of the Transport Planning Society (MTPS).

5.2 Methodology

Legislation and Guidance

5.2.1 In accordance with best practice, the assessment of transport effects has been undertaken in line with advice set out in the *"Guidelines for the Environmental Assessment of Traffic and Movement"* produced by the Institute of Environmental Management and Assessment (IEMA) (July 2023).

Study Area

5.2.2 The study area for the assessment includes the following road links:

i) Link 1: Bourne Road east of Beech Drive;
ii) Link 2: Bourne Road east of the Bourne Road / Fleetwood Road North signalised junction;
iii) Link 3: Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction;
iv) Link 4: Bourne Way east of the Amounderness Way / Bourne Way signalised junction;
v) Link 5: Amounderness Way north of the Amounderness Way / Bourne Way signalised junction; and,
vi) Link 6: Amounderness Way south of the Amounderness Way / Bourne Way signalised junction.

Assessment Criteria and Assignment of Significance

5.2.3 In accordance with the "*Guidelines for the Environmental Assessment of Traffic and Movement*", the significance of effects has been assessed by considering the interaction between the magnitude of the impact and the sensitivity of the receptor in the abovementioned study area.

5.2.4 The assessment considers the transport-related effects of the Proposed Development as measured against the anticipated future baseline scenarios during the application year of 2026 and five years following the application year (2031), whilst also considering the relevant committed schemes that are likely to affect the future baseline traffic conditions.

5.2.5 The IEMA guidelines recommend two broad rules of thumb as criteria to assist in delimiting the scale and extent of the environmental assessment:

i) Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles (HGV) will increase by more than 30%); and,
ii) Rule 2: Include any other specifically sensitive areas where total traffic flows have increased by 10% or more.

5.2.6 The above guidance is based upon research, knowledge and experience of environmental effects of traffic, as included in the IEMA guidance, with a 30% increase considered to be a "*reasonable threshold*" (paragraph 3.19) for inclusion in the assessment of the environmental effects of traffic. At a simple level, the guidance considers that projected changes in total traffic flow of less than 10% creates "*no discernible environmental impact*" (paragraph 3.16), hence the second threshold as set out in Rule 2.

5.2.7 In cases where the thresholds are exceeded, the IEMA guidelines set out a list of environmental effects which should be assessed for their magnitude of change.

5.2.8 Definitions of each of the potential effects identified in the IEMA guidelines are summarised below, along with explanatory text relating to assessment criteria to determine the magnitude of impact. It is on this basis that the assessment in this Chapter has been undertaken.

5.2.9 It is acknowledged in the IEMA guidelines that not all environmental effects are applicable to every development, but the list of effects included in the assessment has been established through detailed discussions on the scope of the ES.

5.2.10 The environmental effects of traffic considered in other chapters of this ES include the following:

i) Ecological Effects – set out in Chapter 6.0 of the ES;
ii) Noise and Vibration – potential effects relating to noise and vibration as a result of traffic are assessed in Chapter 7.0; and
iii) Air Quality – the potential effects relating to air quality as a result of traffic and construction dust and dirt from construction traffic are assessed in Chapter 8.0.

5.2.11 The environmental effects of traffic considered in this Chapter are discussed below.

Accidents and Safety

5.2.12 The TS contains a detailed analysis of recent accident data on the study area. The analysis concludes that the highways network has a low accident rate and there are no clusters of accidents that could be evidence of accident 'hotspots'. On this basis the effects of the Proposed Development in terms of Accidents and Safety are not considered in this Chapter.

Driver and Non-Motorised User (NMU) Delay

5.2.13 Where roads affected by development are at or near capacity, the traffic associated with such development can cause or add to vehicle delays.

5.2.14 Sources of delay for non-development traffic could potentially include:

i) at the Site access where there would be additional turning movements;
iii) on the roads passing the Site where there is likely to be additional traffic;
iv) at other key intersections within the study area which might be affected by increased traffic; and,
v) on the minor arms of junctions where the ability to find gaps in passing major road traffic may be reduced, thereby lengthening delays.

5.2.15 Where relevant, the effects on driver delay are considered within this Chapter and the magnitude of impact is identified using professional judgement and the advice provided in the IEMA guidelines.

5.2.16 There are a range of factors affecting NMU delay. The IEMA guidelines do not set out thresholds for judging the significance of changes in levels of delay, although the guidance notes that "pedestrian delay and severance are closely related effects and can be grouped together". As such, where relevant, the effects on NMU delay will be considered in conjunction with the assessment of severance, as described below.

Severance

5.2.17 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. The term is used to describe a complex series of factors that separate people from places and other people. Severance can also result from difficulty in crossing a heavily trafficked road and can also relate to relatively minor traffic flows if they impede pedestrian access to essential facilities (IEMA, July 2023).

5.2.18 The guidance notes that the Department for Transport (DfT) has historically set out a range of indicators for determining the significance of severance, which denoted severance effects as being considered 'slight', 'moderate' and 'substantial' with changes in traffic flows of 30%, 60% and 90%, respectively. The guidance also notes that "*although these thresholds do not appear in current DfT guidance, they have not been superseded by subsequent changes to guidance and are established in planning case law. However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts, even with high percentage changes in traffic*".

5.2.19 Where relevant to do so, the Proposed Development-related effects on severance are considered later within this Chapter.

Non-Motorised User Amenity (including Fear and Intimidation)

5.2.20 Amenity is broadly defined as "*the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width / separation from traffic*". This definition also includes fear and intimidation. The previous (1993) IEMA guidance suggested that a tentative threshold for judging the significance of the effects of traffic on pedestrian and cycle amenity would be where the traffic flow is halved or doubled. However, the current guidance notes that "*although these thresholds no longer appear in DfT guidance, they have not been superseded by subsequent changes to guidance and are established in planning case law. Thresholds are expressed as a starting point for any assessment and typically have been derived from studies of major changes in traffic flow and therefore should be used cautiously in any assessment.*"

5.2.21 Where relevant to do so, the Proposed Development-related effects on pedestrian and cyclist amenity (including fear and intimidation) across the local highway network within the study area are considered later within this Chapter.

5.2.22 The Proposed Development will not affect any footpaths or Public Rights of Way (PRoWs) and so the assessment of pedestrian and cyclist amenity in relation to footpaths has not been considered in this Chapter.

Hazardous Loads

5.2.23 The Proposed Development would take bottom ash from EfWs that accept municipal (household), commercial and industrial waste. As such, it is not considered that any loads being delivered to the Proposed Development would be considered to be hazardous. Furthermore, analysis of the local highway network within the study area indicates that there are no significant features, such as significant drops immediately beyond the carriageway, which would suggest that the transfer of materials poses a particular risk beyond that which would be expected on the general highway network.

5.2.24 The effect of the Proposed Development with regard to hazardous and dangerous loads has therefore been scoped out of further detailed assessment within this Chapter.

Receptor Sensitivity / Value

5.2.25 Paragraph 1.30 of the IEMA guidelines explains that groups or locations which may be sensitive to changes in traffic conditions could be:

i) people at home;
ii) people in work places;
iii) sensitive groups such as children, the elderly or people with disabilities;
iv) sensitive locations such as hospitals, churches, schools or historical buildings;
v) people walking;
vi) people cycling;
vii) open spaces, recreational sites, shopping areas;
viii) sites of ecological/nature conservation value; and,
ix) sites of tourist/visitor attraction.

5.2.26 As a general guide, the determination of receptor sensitivity is based on the criteria of value, adaptability and tolerance. In terms of transport, receptors include people that are living in and using facilities and using transport networks in the area.

5.2.27 Sensitivity to changes in transport conditions is generally focussed on vulnerable user groups who are less able to tolerate, adapt to or recover from changes. **Table 5.1** summarises the broad criteria for identifying receptor sensitivity.

Table 5.1 – Receptor Sensitivity Summary (Traffic and Transport)

Sensitivity	Description
Very High	Schools, colleges, playgrounds, hospitals, retirement homes
High	Heavily congested junctions, residential properties very close to carriageway
Medium	Congested junctions, shops/businesses, areas of heavy pedestrian / cycling use, areas of ecological / nature conservation, residential properties close to carriageway
Low	Tourist / visitor sites, places of worship, residential areas set back from the highway with screening

5.2.28 The link sensitivity has been based upon an average sensitivity of the whole link, with a separate assessment of high / very high sensitivity receptors where relevant. Longer links have been broken down into sensible smaller sections where appropriate.

5.2.29 Road links considered to be of low or medium sensitivity have been assessed against the ‘Rule 1’ threshold described above (>30% increase in traffic flow). Road links considered to be of high or very high sensitivity have been assessed against the ‘Rule 2’ threshold described above (>10% increase in traffic flow).

Magnitude of Impact

5.2.30 The criteria for defining magnitude in this Chapter is based upon the advice contained within the IEMA guidelines, as shown in **Table 5.2**.

Table 5.2 – Magnitude Definition (Traffic and Transport)

Magnitude	Adverse / Beneficial	Description
High	Adverse	Substantial or total loss of capability for movement along or across transport corridors, loss of access to key facilities and loss of road safety. Severe delays to travellers.
	Beneficial	Large scale improvement in the capability for movement along and across transport corridors, major improvement in access to key facilities, in road safety and in delays to travellers.
Medium	Adverse	Moderate loss of capability for movement along or across transport corridors, loss of access to key facilities and loss of road safety. Severe delays to travellers.
	Beneficial	Moderate improvement in the capability for movement along and across transport corridors, major improvement in access to key facilities, in road safety and in delays to travellers.
Low	Adverse	Minor shift away from baseline conditions. Some measurable loss of capability for movement along and across transport corridors, some measurable loss of access to key facilities and some measurable loss of road safety. Some measurable increase in delays to travellers.
	Beneficial	Very minor increase in capability for movement along and across transport corridors, very minor increase in access to key facilities and very minor increase in road safety. Very minor decreases in delays to travellers.
Negligible	Adverse	Very minor loss of capability for movement along and across transport corridors, very minor loss of access to key facilities and very minor loss of road safety. Very minor increase in delays to travellers.
	Beneficial	Very minor increase in capability for movement along and across transport corridors, very minor increase in access to key facilities and very minor increase in road safety. Very minor decreases in delays to travellers.
No Change	n/a	No loss of capability for movement along and across transport corridors, no change of access to key facilities and road safety. No delay to travellers.

Significance of Effects

5.2.31 The significance of the effects of the Scheme with regard to traffic and transport is determined by correlating the magnitude of the impact and the sensitivity of the receptor.

5.2.32 The general approach adopted for evaluating the significance of effects is outlined in **Table 5.3**. Effects predicted to be 'major' or 'moderate' are considered significant whilst effects predicted to be 'minor' or 'negligible' are considered not significant.

Table 5.3 – Significance of Effects Matrix (Traffic and Transport)

Impact Magnitude	Receptor Sensitivity				
	Negligible	Low	Medium	High	Very High
High	Minor	Moderate	Moderate	Major	Major
Medium	Negligible	Minor	Moderate	Moderate	Major
Low	Negligible	Negligible	Minor	Moderate	Moderate
Negligible	Negligible	Negligible	Negligible	Minor	Minor

Limitations

5.2.33 As some of the traffic flow data (particularly committed development flows extracted from information available on Wyre Council's planning portal) has been derived from multiple sources, the AM and PM peak hours are inconsistent and do not necessarily all refer to the network AM (08:00 – 09:00) and PM (16:00 – 17:00) peak hours. The peak hour traffic figures given in this document therefore refer to a theoretical peak hour which comprises the peak hour flows of multiple committed developments and the Proposed Development traffic flows.

5.3 Baseline

Local Highway Network

5.3.1 The characteristics of the surrounding local highway network are described in greater detail in the TS accompanying the application. The sensitivity of surrounding highway links to environmental effects is considered later in this Chapter.

5.3.2 Vehicular access to the site is currently provided via a simple bell-mouth junction off an unnamed industrial access road (the industrial road infrastructure of the HIEZ) (South Road). The HIEZ itself is accessed via Bourne Street which meets with the HIEZ at a priority-controlled crossroads.

5.3.3 Bourne Road / Bourne Street is an unadopted private road and features a secure gatehouse which controls entry into the HIEZ for HGVs and staff. Planning permission was granted by Wyre Council (WC) for the relocation of the existing gatehouse and the introduction of an additional access lane (planning application ref: 21/00705/FUL). This will significantly reduce congestion at the gatehouse and reduced traffic flows along Bourne Road.

Bourne Road / Bourne Street

5.3.4 Bourne Road / Bourne Street is a private two-way single lane road which runs in an approximately east / west alignment in the vicinity of the site. The road runs from the Bourne Road / Fleetwood Road North signalised junction to the west of the site to the existing HIEZ gatehouse circa 800m to the east.

5.3.5 Bourne Road / Bourne Street features a circa 7.5m carriageway width with a circa 1.0m wide pedestrian footway on the southern side of the road over its entire length.

5.3.6 Although Bourne Road is a private road and is not therefore subject to a publicly enforceable speed limit, the distinction between the public road network and Bourne Road is not clear, and it is expected that drivers accord with the publicly enforced speed limit of 30mph. At the existing gatehouse and leading into the HIEZ there is a 20mph speed limit (denoted by signage at the approach to the gatehouse).

B5268 Fleetwood Road North

5.3.7 The B5268 Fleetwood Road North is a two-way, single lane classified B-road which runs in a roughly north / south alignment in the vicinity of the site. The road runs from the Fleetwood Road North / Amounderness Way ‘Eros Roundabout’ to the north-west of the site to the Fleetwood Road North / Victoria Road East / Fleetwood Road South signalised crossroad circa 3.75km to the south.

5.3.8 Fleetwood Road North forms a main arterial route connecting the residential area surrounding Thornton to Fleetwood to the north and running parallel to Amounderness Way to the west.

5.3.9 Fleetwood Road North features a circa 2.0m – 3.0m variable width pedestrian footway on the western side of the road and a circa 3.0m wide footway on the eastern side of the road.

5.3.10 A mandatory 30mph speed limit is enforced over the section of Fleetwood Road North between the Bourne Road / Fleetwood Road North signalised junction to the west of the site and the Fleetwood Road North / Victoria Road East / Fleetwood Road South signalised crossroads. North of the Bourne Road / Fleetwood Road North signalised junction the road transitions into a 40mph speed limit.

Bourne Way

5.3.11 Bourne Way is a two-way single lane road which runs in an approximately east / west alignment in the vicinity of the site. The road runs from the Bourne Way / Amounderness Way signalised junction to the Bourne Way / Fleetwood Road North / Bourne Road signalised crossroad circa 600m to the east.

5.3.12 Bourne Way features a circa 7.5m carriageway width with a circa 2.0m wide pedestrian footway on both sides of the eastern section of the road up to the Pheasant Wood Drive junction. Bourne Way features a circa 2.5m wide shared foot / cycleway on the southern side of the road on the western section of the road from the Bourne Way / Amounderness Way signalised junction to the Pheasant Wood Drive junction. The road is subject to a mandatory 30mph speed limit.

A585 Amounderness Way

5.3.13 The A585 Amounderness way is a two-lane dual carriageway which runs in an approximately north / south alignment in the vicinity of the site. The road is a primary A-road which runs from the A585 / A587 / Anchorage Road roundabout at Fleetwood to the Amounderness Way / Breck Road roundabout at Poulton-le-Fylde circa 7.75km to the south-east.

5.3.14 Within the vicinity of the site, Amounderness Way features a two-lane dual carriageway, widening to three lanes on the northbound approach to the Amounderness Way / Bourne Road signalised junction. Amounderness Way features a circa 20.0m width (including the variable circa 2.0m – 5.0m wide central reservation). There is a circa 3.0m wide shared foot / cycleway on the eastern side of the road in the vicinity of the site and the road is subject to a 40mph mandatory speed limit.

Receptors

5.3.15 Receptors to be considered within the assessment have been selected based upon the access routes to be taken by vehicle movements generated by the Proposed Development. The Proposed Development traffic distribution is provided in greater detail later in this Chapter.

5.3.16 **Table 5.4** highlights the qualification of the sensitivity assessment of each receptor group.

Table 5.4 – Sensitivity of Receptors

Link No.	Link Description	Sensitivity	Qualification
1	Bourne Road east of Beech Drive	Low	A new residential development currently under construction which will be served directly from this road on the northern side of the carriageway, although these dwellings will be well set back from the carriageway. A footway is provided on the southern side of the carriageway so there is potential for some pedestrian movements. No highly sensitive receptors or vulnerable user groups.
2	Bourne Road east of the	Low	There are housing estates located on the northern and southern sides of the

Link No.	Link Description	Sensitivity	Qualification
	Bourne Road / Fleetwood Road North signalised junction		carriageway, although these dwellings are set back from the carriageway and are fenced. A footway is provided on the southern side of the carriageway so there is potential for some pedestrian movements. No highly sensitive receptors or vulnerable user groups.
3	Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction	Low	There is a housing estate located on the southern side of the carriageway, although these dwellings are set back from the carriageway. A shared foot / cycleway is provided on the southern side of the carriageway so there is potential for some pedestrian / cycle movements. No highly sensitive receptors or vulnerable user groups.
4	Bourne Way east of the Amounderness Way / Bourne Way signalised junction	Low	There are housing estates located on the northern and southern sides of the carriageway, although these dwellings are well set back from the carriageway with grass bunds providing additional separation. Footways are provided on the northern and southern sides of the carriageway so there is potential for some pedestrian movements. No highly sensitive receptors or vulnerable user groups.
5	Amounderness Way north of the Amounderness Way / Bourne Way signalised junction	Negligible	A primary road with a high capacity for traffic. There are housing developments on the eastern and western sides of the carriageway although these are set back and / or separated by fencing. There are no footway provisions on either side of the road. No highly sensitive receptors or vulnerable user groups.
6	Amounderness Way south of the Amounderness Way / Bourne Way signalised junction	Low	A primary road with a high capacity for traffic. There are housing developments on the eastern and western sides of the carriageway although they are set back from the road and separated by vegetation and fencing. A shared foot / cycleway is provided on the eastern side of the carriageway so there is potential for some pedestrian / cycle movements. No highly sensitive receptors or vulnerable user groups.

5.3.17 On the basis of the above, all links should be assessed against the 'Rule 1' threshold (>30% increase in traffic flow) to consider if there would be a material adverse effect.

Baseline Methodology

5.3.18 The current baseline conditions have been established by obtaining recent traffic survey data within the abovementioned study area. This baseline data is described in further detail below.

Baseline Traffic Flows

5.3.19 Baseline traffic flow patterns have been established from the 2022 Thornton Energy Recovery Centre (TERC) application. These were established via Manual Classified Count (MCC) traffic surveys undertaken at the following key network locations:

i) The Fleetwood Road North / Bourne Road / Bourne Way signalised crossroads; and
ii) The Amounderness Way / Bourne Way signalised junction.

5.3.20 The above surveys were collected during a neutral weekday (Tuesday 13th September 2022), covering three-hour periods surrounding the traditional peak hours (7:00am – 10:00am and 4:00pm – 7:00pm).

5.3.21 Additional Automatic Traffic Counters (ATCs) were also installed at the following links:

i) Bourne Road (East of Beech Drive); and
ii) Bourne Road (West of Beech Drive).

5.3.22 The ATC data was collected over a 7-day period between 20th and 26th September 2022.

5.3.23 Interrogation of the traffic survey data indicates that the network peak hours for the surrounding highway network are 08:00 – 09:00 and 16:00 – 17:00, in the AM and PM, respectively.

5.3.24 The 2022 baseline peak AM (08:00 – 09:00) and PM (16:00 – 17:00) flows have been derived from the traffic survey data for an average weekday (i.e. Monday to Friday). To provide additional context, the Annual Average Weekday Traffic (AAWT) and Saturday flows, which correspond to the core waste delivery of imported IBA and exported IBAA (07:00 – 19:00), have also been provided. The 2022 baseline vehicle traffic flows are summarised in **Table 5.5** below:

Table 5.5 – Summary of 2022 Baseline Traffic Flows

Link	Description	AM		PM		AAWT		Sat	
		Vehs	HGVs	Vehs	HGVs	Vehs	HGVs	Vehs	HGVs
1	Bourne Road east of Beech Drive	167	28	185	20	1655	349	569	95
2	Bourne Road east of the Bourne Road / Fleetwood Road North signalised junction	344	17	363	8	3325	118	1143	40
3	Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction	254	25	287	17	2544	197	875	68
4	Bourne Way east of the Amounderness Way / Bourne Way signalised junction	344	19	347	15	3249	160	1117	55
5	Amounderness Way north of the Amounderness Way / Bourne Way signalised junction	1477	34	1486	20	13933	254	4790	87
6	Amounderness Way south of the Amounderness Way / Bourne Way signalised junction	1653	51	1701	35	15771	404	5422	139

Future Baseline

Assessment Scenarios

5.3.25 The assessment compares the development-related traffic impacts measured against the following anticipated future baseline traffic scenarios:

i) **Year of Opening (2026):** Calculated as the 2022 baseline network traffic multiplied by the relevant future year growth factor + trips associated with any committed developments; and,

ii) **Future Design Year (2031):** Calculated as the 2022 baseline network traffic multiplied by the relevant future year growth factor + trips associated with any committed developments.

5.3.26 By forecasting the future baseline conditions, the environmental effects caused by the traffic generated by the Proposed Development can then be established by comparing the 'with development' scenario against the 'without development' scenario in the 2026 and 2031 future assessment years.

Future Year Traffic Growth Assumptions

5.3.27 Guidance published by the DfT identifies that future estimates of traffic should be made through the application of regional growth factors derived from the National Transport Model (NTM). NTM forecasts give traffic growth by region, road type and whether the area is built up or not. These forecasts are then adjusted by local TEMPRO factors to reflect local traffic trends.

5.3.28 The relevant TEMPRO growth factors for the 'Wyre 011' Middle Layer Super Output Area (MSOA) have been used to forecast the growth in background traffic between the baseline year (2022) and the assessment years (2026 and 2031). These are summarised in **Table 5.6**.

Table 5.6 – TEMPRO Adjusted NTM Growth Factors

Period	2022 - 2026	2022 - 2031
Weekday AM Peak	1.0277	1.0832
Weekday PM Peak	1.0281	1.0843
Average Weekday	1.0293	1.0871

Committed Development Traffic

5.3.29 AXIS has investigated information available from the WC planning application portal to examine the status and proximity any nearby committed developments that might have a material effect on flows within the ES study area, and which also satisfy the relevant NPPG criteria which advises only including "*development that is consented or allocated where there is a reasonable degree of certainty will proceed within the next 3 years*".

5.3.30 This approach differs slightly from the assessment of 'cumulative effects' schemes set out within Chapter 2.0 of this ES, which considers wider potential environmental effects more generally. However, it is considered that this provides the most appropriate assessment for specific transport related impacts given the approach suggested in the NPPG.

5.3.31 The key committed developments of relevance to this assessment are:

i) 20/00405/LMAJ – The erection of 210 residential dwellings on land off Bourne Road;
ii) 19/00347/FULMAJ – A hybrid planning application consisting of full planning permission for the erection of 41 dwellings and outline permission for up to 45 dwellings and 42 apartments (all matters reserved except for access) at the site of the Thornton-Cleveleys Football Club;
iii) 23/01214/LCC – Proposed development of an Energy Recovery Centre and associated infrastructure (LCC/2023/0003); and
iv) 22/00762/FULMAJ – Proposed erection of 160 new dwellings on land located to the west of Fleetwood Road North, Thornton Cleveleys.

5.3.32 Where necessary, the traffic flows associated with the committed developments have been derived from the TA work that accompanied the planning applications, and / or using engineering judgement for those respective schemes, to distribute and assign those committed development flows within the area of study.

5.3.33 Development trips for each of these developments have been calculated for the AM, PM and AAWT periods. Committed development trips at weekends are expected to be negligible for all of these sites. As such it is considered that any additional weekend trips associated with these sites will be covered by the background growth accounted for within the TEMPRO growth factors, and no separate committed development trips have been calculated for the Saturday period.

5.3.34 Both the Bourne Road and Thornton-Cleveleys Football Club committed developments were partially constructed when the traffic surveys were undertaken and therefore a proportion of the development trips would have already been counted.

5.3.35 To account for the ongoing build-out of these committed developments during the future baseline scenarios, a percentage build-out figure has been estimated with regards to the existing completion rate of the developments and phasing details provided in the planning applications for those developments. The traffic assignment of the committed developments has been reduced commensurately to their completion status during the future baseline scenarios.

5.3.36 The percentage buildout has been established based on engineering judgement and experience on various similar schemes. The estimated completion status of each committed development during the assessed scenarios are shown in **Table 5.7**.

Table 5.7 – Committed Development Completion Status

Committed Development	% Completion		
	2022	2026	2031
20/00405/LMAJ	15%	25%	100%
19/00347/FULMAJ	35%	60%	100%

Future Year Baseline Traffic Flows

5.3.37 The 2026 assessment year baseline flows (year of opening) are the sum of the 2022 observed flows multiplied by the relevant TEMPRO growth factor (2022 to 2026), plus trips from committed developments. These are set out in **Table 5.8**.

Table 5.8 – Summary of 2026 Baseline Traffic Flows

Link	Description	AM		PM		AAWT		Sat	
		Vehs	HGVs	Vehs	HGVs	Vehs	HGVs	Vehs	HGVs
1	Bourne Road east of Beech Drive	184	34	201	25	1865	418	586	98
2	Bourne Road east of the Bourne Road / Fleetwood Road North signalised junction	375	22	394	13	3634	179	1178	42
3	Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction	274	31	273	18	2493	194	810	47
4	Bourne Way east of the Amounderness Way / Bourne Way signalised junction	367	24	371	20	3490	223	1151	57
5	Amounderness Way north of the Amounderness Way / Bourne Way signalised junction	1521	36	1530	22	14369	279	4936	90
6	Amounderness Way south of the Amounderness Way / Bourne Way signalised junction	1709	56	1760	39	16350	457	5588	143

5.3.38 The 2031 assessment year baseline flows (future design year) are the sum of the 2022 observed flows multiplied by the relevant TEMPRO growth factor (2022 to 2031), plus trips from committed developments. These are set out in **Table 5.9**.

Table 5.9 – Summary of 2031 Baseline Traffic Flows

Link	Description	AM		PM		AAWT		Sat	
		Vehs	HGVs	Vehs	HGVs	Vehs	HGVs	Vehs	HGVs
1	Bourne Road east of Beech Drive	247	35	257	27	2433	438	620	103
2	Bourne Road east of the Bourne Road / Fleetwood Road North signalised junction	464	23	475	14	4379	186	1245	44
3	Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction	316	32	320	19	2898	202	856	49
4	Bourne Way east of the Amounderness Way / Bourne Way signalised junction	414	25	423	21	3957	232	1217	60
5	Amounderness Way north of the Amounderness Way / Bourne Way signalised junction	1609	38	1619	23	15221	294	5217	95
6	Amounderness Way south of the Amounderness Way / Bourne Way signalised junction	1823	59	1883	41	17496	480	5906	151

5.4 Assessment of Effects

Construction Phase

5.4.1 The construction period is expected to commence in Q3 2025 and last for approximately 16 months. This duration includes site construction, delivery and set up of modular buildings, the installation and commissioning of the processing plant. As such, all effects will be short-term and temporary.

5.4.2 Appendix 8 within the accompanying TS provides an initial estimate of the construction-related traffic generation during the separate phases of the construction period. This has been derived based on information supplied by the applicant and Axis' experience of delivering similar schemes throughout the UK and identifies that the Proposed Development would generate approximately 105 two-way vehicle trips per day, on average, throughout the construction period. This would comprise approximately 73 two-way construction staff trips and 32 two-way HGV movements per day, on average.

5.4.3 As described in paragraph 5.4.7 below, during the operational phase, the Proposed Development is anticipated to generate approximately 242 two-way vehicle trips per day on weekdays. The construction phase of the development is therefore expected to result in a lesser traffic impact that the operational phase. On this basis, no further detailed assessment of the traffic impacts during the construction phase is considered necessary.

5.4.4 During the construction phase, construction traffic would be routed to / from the site primarily via the A585 Amounderness Way to the south of the A585 Amounderness Way / Bourne Way junction. A construction traffic management plan (CTMP) would be prepared, which would identify the location of temporary signage to be erected on the local highway network to ensure that the routing of construction HGVs is in accordance with the agreed haulage routes. The CTMP would also identify other suitable mitigation measures that will be adopted to manage any adverse effects of construction, as described in Section 6.4 of the accompanying TS.

Operational Phase

Trip Forecast Methodology and Parameters

5.4.5 The transport-related environmental effects arising from the Proposed Development have been assessed for the following years / scenarios:

i) 2026 Year of Opening;
ii) 2026 Year of Opening ('Sensitivity Test' Scenario) (see paragraph 5.4.13);
iii) 2031 Future Design Year; and
iv) 2031 Year of Opening ('Sensitivity Test' Scenario) (see paragraph 5.4.13).

Traffic Generation

5.4.6 The likely level of trip generation of the Proposed Development has been forecast using a 'first principles' approach, which is based on the future operation of the Proposed Development. Traffic forecasts associated with the Proposed Development have been calculated based on a series of robust assumptions, which utilise industry knowledge and information supplied by the applicant.

5.4.7 Full details of the trip generation methodology are set out in Section 5.7 of the TS accompanying this application. In summary, the Proposed Development is expected to result in approximately 206 two-way HGV trips and 36 two-way light vehicle movements, associated with staff trips, during the weekday operational delivery hours (07:00 – 19:00 AAWT). There would be approximately 16 two-way HGV movements during both the local highway network weekday AM (08:00 – 09:00) and PM (16:00 – 17:00) peak hours.

Development Trip Distribution

5.4.8 The TS sets out the methodology that has been used to forecast the distribution of car and HGV trips generated by the Proposed Development.

5.4.9 The exact source of waste and associated distribution is unknown at this stage. It is nonetheless expected that HGVs will route primarily via the surrounding strategic highway network, minimising impact on sensitive receptors and avoiding residential areas where possible or where such movements are expressly prohibited (i.e. weight restrictions).

5.4.10 The estimated traffic distribution for HGV traffic therefore assumes that approximately 70% of development-related HGV movements will route via a southerly direction along the A575 Amounderness Way to / from the A585 Amounderness Way / Bourne Way signalised junction, with 30% routing via a northerly direction to / from this junction.

5.4.11 The trip distribution for staff car trips has been estimated based on 2011 Census 'journey to work' data for the 'Wyre 011' MSOA (census dataset WU03EW).

5.4.12 The distribution by vehicle type is summarised in **Table 5.10**.

Table 5.10 – Summary of Proposed Development Trip Distribution

Route (From the Site)	% Distribution	
	Lights	HGVs
North on Amounderness Way (N)	4%	30%
South on Amounderness Way (S)	50%	70%
North on Fleetwood Road North (N)	12%	0%
South on Fleetwood Road North (S)	34%	0%
Total	**100 %**	**100%**

5.4.13 As an additional sensitivity test to ensure that local links are robustly able to accommodate the Proposed Development traffic generation, a separate scenario will also be considered in which 100% of HGV traffic is distributed in a southerly direction along the A585 Amounderness Way. This represents a theoretical 'worst case' in terms of traffic distribution, with regards to the likely origin of IBA/IBAA and the layout of the surrounding strategic road network.

Impacts During Year of Opening (2026)

5.4.14 **Table 5.11** sets out the predicted changes in vehicle / HGV movements during the 2026 year of opening.

Table 5.11 – Percentage Impact Assessment Summary (2026)

2026 AM Peak Hour Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles**	**% Impact HGVs**
1	184	34	16	16	8.71	47.56
2	375	22	16	16	4.26	71.63
3	274	31	16	16	5.84	52.36
4	367	24	16	16	4.36	65.60
5	1521	36	5	5	0.32	13.19
6	1709	56	11	11	0.66	20.07
2026 PM Peak Hour Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles**	**% Impact HGVs**
1	201	25	16	16	7.95	62.92
2	394	13	16	16	4.06	122.23
3	273	18	16	16	5.85	87.76
4	371	20	16	16	4.32	78.87

5	1530	22	5	5	0.31	21.80
6	1760	39	11	11	0.64	28.43
2026 Saturday Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles**	**% Impact HGVs**
1	586	98	166	130	28.31	132.78
2	1178	42	158	130	13.38	312.14
3	810	47	149	130	18.44	278.69
4	1151	57	149	130	12.97	229.51
5	4936	90	40	39	0.82	43.35
6	5588	143	109	91	1.95	63.52
2026 AAWT Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles**	**% Impact HGVs**
1	1865	418	242	206	12.98	49.30
2	3634	179	234	206	6.43	114.84
3	2493	194	225	206	9.04	106.24
4	3490	223	225	206	6.46	92.40
5	14369	279	63	62	0.44	22.16
6	16350	457	162	144	0.99	31.55

Link 1: Bourne Road east of Beech Drive;

Link 2: Bourne Road east of the Bourne Road / Fleetwood Road North signalised junction;

Link 3: Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction;

Link 4: Bourne Way east of the Amounderness Way / Bourne Way signalised junction; and,

Link 5: Amounderness Way north of the Amounderness Way / Bourne Way signalised junction; and,

Link 6: Amounderness Way south of the Amounderness Way / Bourne Way signalised junction.

5.4.15 **Table 5.11** shows that the forecast changes in peak hour vehicle and AAWT demand during the operation of the Proposed Development in 2026 fall below the IEMA Rule 1 30% threshold for all links. The impacts also fall below the lower Rule 2 10% threshold on the majority of links, only marginally exceeding this level on link 1 in the AAWT period, and on links 1, 2, 3 & 4 on Saturdays.

5.4.16 The scheme is anticipated to result in an HGV percentage impact greater than the IEMA 30% threshold on some localised links during the AM and PM peak hours (links 1, 2, 3, & 4) and AAWT periods (links 1, 2, 3 4 and 6). The HGV percentage impact is indicated to be above this threshold on all links on Saturdays.

5.4.17 The percentage impact assessment should be viewed in the context of the low baseline traffic flows observed on many of the links, particularly on Saturdays, which therefore creates the impression, when viewed comparatively, that the impact of the Proposed Development traffic ostensibly appears to be disproportionally large. Nevertheless, further assessment of operational traffic impacts has been undertaken for these links in the 2026 year of opening scenario.

Impacts During Year of Opening (2026 Sensitivity Test)

5.4.18 **Table 5.12** sets out the predicted changes in vehicle / HGV movements during the 2026 year of opening sensitivity test scenario.

Table 5.12 – Percentage Impact Assessment Summary (2026 Sensitivity Test)

2026 AM Peak Hour Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	184	34	16	16	8.71	47.56
2	375	22	16	16	4.26	71.63
3	274	31	16	16	5.84	52.36
4	367	24	16	16	4.45	65.60
5	1521	36	0	0	0.02	0.00
6	1709	56	16	16	0.94	28.66
2026 PM Peak Hour Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	201	25	16	16	7.95	62.92
2	394	13	16	16	4.06	122.23
3	273	18	16	16	5.85	87.76
4	371	20	16	16	4.32	78.87
5	1530	22	0	0	0.00	0.00
6	1760	39	16	16	0.91	40.62
2026 Saturday Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	586	98	166	130	28.31	132.78
2	1178	42	158	130	13.38	312.14
3	810	47	149	130	18.44	278.69
4	1151	57	149	130	12.97	229.51
5	4936	90	1	0	0.03	0.00
6	5588	143	148	130	2.64	90.74
2026 AAWT Scenario						

Link	Base vehicles	Base HGVs	Development vehicles	Development HGVs	% Impact vehicles*	% Impact HGVs*
1	1865	418	242	206	12.98	49.30
2	3634	179	234	206	6.43	114.84
3	2493	194	225	206	9.04	106.24
4	3490	223	225	206	6.46	92.40
5	14369	279	1	0	0.01	0.00
6	16350	457	224	206	1.37	45.07

Link 1: Bourne Road east of Beech Drive;

Link 2: Bourne Road east of the Bourne Road / Fleetwood Road North signalised junction;

Link 3: Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction;

Link 4: Bourne Way east of the Amounderness Way / Bourne Way signalised junction; and,

Link 5: Amounderness Way north of the Amounderness Way / Bourne Way signalised junction; and,

Link 6: Amounderness Way south of the Amounderness Way / Bourne Way signalised junction.

5.4.19 **Table 5.12** shows that the forecast changes in peak hour vehicle and AAWT demand during the operation of the Proposed Development in the 2026 sensitivity test scenario fall below the IEMA Rule 1 30% threshold for all links. The impacts also fall below the lower Rule 2 10% threshold on the majority of links, only marginally exceeding this level on link 1 in the AAWT period, and on links 1, 2, 3 & 4 on Saturdays.

5.4.20 The scheme is anticipated to result in an HGV percentage impact greater than the IEMA 30% threshold on some localised links during the AM peak hour (links 1, 2, 3, & 4) and the PM peak hour, Saturday and AAWT periods (links 1, 2, 3 4 and 6).

5.4.21 The percentage impact assessment should be viewed in the context of the low baseline traffic flows observed on many of the links, which therefore creates the impression, when viewed comparatively, that the impact of the Proposed Development traffic ostensibly appears to be disproportionally large. Nevertheless, further assessment of operational traffic impacts has been undertaken for these links in the 2031 future year.

Impacts During Future Year (2031)

5.4.22 **Table 5.13** sets out the predicted changes in vehicle / HGV movements during the 2031 future design year.

Table 5.13 – Percentage Impact Assessment Summary (2031)

2031 AM Peak Hour Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	247	35	16	16	6.48	45.46
2	464	23	16	16	3.45	68.73
3	316	32	16	16	5.07	50.09
4	414	25	16	16	3.87	62.88
5	1609	38	5	5	0.30	12.54
6	1823	59	11	11	0.61	19.10
2031 PM Peak Hour Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	257	27	16	16	6.22	60.26
2	475	14	16	16	3.37	118.17
3	320	19	16	16	5.01	84.38
4	423	21	16	16	3.78	75.72
5	1619	23	5	5	0.30	20.74
6	1883	41	11	11	0.59	27.08
2031 Saturday Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	620	103	166	130	26.78	125.62
2	1245	44	158	130	12.66	295.32
3	856	49	149	130	17.44	263.67
4	1217	60	149	130	12.27	217.14
5	5217	95	40	39	0.78	41.02
6	5906	151	109	91	1.84	60.09
2031 AAWT Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	2433	438	242	206	9.95	47.03
2	4379	186	234	206	5.34	110.65
3	2898	202	225	206	7.77	102.23
4	3957	232	225	206	5.69	88.72
5	15221	294	63	62	0.42	21.05
6	17496	480	162	144	0.93	30.01

Link 1: Bourne Road east of Beech Drive;

Link 2: Bourne Road east of the Bourne Road / Fleetwood Road North signalised junction;

Link 3: Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction;

Link 4: Bourne Way east of the Amounderness Way / Bourne Way signalised junction; and,

Link 5: Amounderness Way north of the Amounderness Way / Bourne Way signalised junction; and,

Link 6: Amounderness Way south of the Amounderness Way / Bourne Way signalised junction.

5.4.23 **Table 5.13** shows that the forecast changes in peak hour vehicle and AAWT demand during the operation of the Proposed Development in 2031 fall below both the IEMA Rule 1 30% threshold, and the lower Rule 2 10% threshold for all links in the AM, PM and AAWT periods, and only exceeding this level on links 1, 2, 3 & 4 on Saturdays.

5.4.24 The scheme is anticipated to result in an HGV percentage impact greater than the IEMA 30% threshold on some localised links during the AM and PM peak hours (links 1, 2, 3, & 4) and AAWT periods (links 1, 2, 3 4 and 6). The HGV percentage impact is indicated to be above this threshold on all links on Saturdays.

5.4.25 The percentage impact assessment should be viewed in the context of the low baseline traffic flows observed on many of the links, which therefore creates the impression, when viewed comparatively, that the impact of the Proposed Development traffic ostensibly appears to be disproportionally large. Nevertheless, further assessment of operational traffic impacts has been undertaken for these links in the 2031 sensitivity test scenario.

Impacts During Future Year (2031 Sensitivity Test)

5.4.26 **Table 5.14** sets out the predicted changes in vehicle / HGV movements during the 2031 future design year sensitivity test scenario.

Table 5.14 – Percentage Impact Assessment Summary (2031 Sensitivity Test)

2031 AM Peak Hour Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	247	35	16	16	6.48	45.46
2	464	23	16	16	3.45	68.73
3	316	32	16	16	5.07	50.09
4	414	25	16	16	3.95	62.88
5	1609	38	0	0	0.02	0.00
6	1823	59	16	16	0.88	27.28
2031 PM Peak Hour Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***

1	257	27	16	16	6.22	60.26
2	475	14	16	16	3.37	118.17
3	320	19	16	16	5.01	84.38
4	423	21	16	16	3.78	75.72
5	1619	23	0	0	0.00	0.00
6	1883	41	16	16	0.85	38.69
2031 Saturday Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	620	103	166	130	26.78	125.62
2	1245	44	158	130	12.66	295.32
3	856	49	149	130	17.44	263.67
4	1217	60	149	130	12.27	217.14
5	5217	95	1	0	0.03	0.00
6	5906	151	148	130	2.50	85.85
2031 AAWT Scenario						
Link	**Base vehicles**	**Base HGVs**	**Development vehicles**	**Development HGVs**	**% Impact vehicles***	**% Impact HGVs***
1	2433	438	242	206	9.95	47.03
2	4379	186	234	206	5.34	110.65
3	2898	202	225	206	7.77	102.23
4	3957	232	225	206	5.69	88.72
5	15221	294	1	0	0.01	0.00
6	17496	480	224	206	1.28	42.87

Link 1: Bourne Road east of Beech Drive;

Link 2: Bourne Road east of the Bourne Road / Fleetwood Road North signalised junction;

Link 3: Bourne Way west of the Bourne Road / Fleetwood Road North signalised junction;

Link 4: Bourne Way east of the Amounderness Way / Bourne Way signalised junction; and,

Link 5: Amounderness Way north of the Amounderness Way / Bourne Way signalised junction; and,

Link 6: Amounderness Way south of the Amounderness Way / Bourne Way signalised junction.

5.4.27 **Table 5.14** shows that the forecast changes in peak hour vehicle and AAWT demand during the operation of the Proposed Development in the 2026 sensitivity test scenario fall below the IEMA Rule 1 30% threshold, and the lower Rule 2 10% threshold, for all links in the AM, PM and AAWT periods, and only exceeding this level on links 1, 2, 3 & 4 on Saturdays.

5.4.28 The scheme is anticipated to result in an HGV percentage impact greater than the IEMA 30% threshold on some localised links during the AM peak hour (links 1, 2, 3, & 4) and the PM peak hour, Saturday and AAWT periods (links 1, 2, 3 4 and 6).

5.4.29 The percentage impact assessment should be viewed in the context of the low baseline traffic flows observed on many of the links, which therefore creates the impression, when viewed comparatively, that the impact of the Proposed Development traffic ostensibly appears to be disproportionally large.

Driver Delay

5.4.30 Any significant effects of delay to other road users are typically made most apparent during the weekday peak hours when congestion may occur. As previously indicated, although the percentage impact for the majority of links is high with regard to the increase in HGVs, the actual increase in HGV numbers is low in absolute terms in both the AM and PM weekday peak hours. Furthermore, the overall percentage impact in terms of total vehicles is low on all links.

5.4.31 While the percentage impact is indicated to be higher on Saturdays, this is reflective of the fact that baseline traffic flows are significantly lower at weekends compared to the same time period on weekdays. In absolute terms, the increase in traffic flows resulting from the proposed development is also lower on Saturday than on weekdays.

5.4.32 As such, it is not considered that the impact of Proposed Development traffic would result in any appreciable effect on the operation of the assessed road links or the associated junctions, and therefore any increase in driver delay is considered to be minimal.

5.4.33 In accordance with the IEMA guidelines, the sensitivity of receptors along all of the assessed links are considered to be negligible or low. In the 2026 assessment year the magnitude of impact upon driver delay is deemed to be medium on links 2 and 3, and low on all other links. In the 2031 assessment year the magnitude of impact upon driver delay is deemed to be medium on link 2 only, and low on all other links. The effect on driver delay is therefore considered to be of **negligible or minor** significance on all the assessed links.

Severance

5.4.34 The IEMA guidelines indicate that severance effects are considered ‘slight’, ‘moderate’ and ‘substantial’ with changes in traffic flows of 30%, 60% and 90% respectively.

5.4.35 Although the percentage impact of the development is above the 30% threshold with regard to HGV movements for the majority of links in all scenarios, the actual increase in HGV numbers is low in absolute terms, particularly in the AM and PM weekday peak hours. Furthermore, the overall percentage impact in terms of total vehicles is low on all links.

5.4.36 If severance is defined by the IEMA as *"the perceived division that can occur within a community when it becomes separated by major transport infrastructure",* then it can reasonably be concluded that the impacts on all the assessed links (which are defined as being negligible to low sensitivity) would not, in practice, result in any material community severance effects occurring.

5.4.37 The proposed traffic increase brought about by the Proposed Development is low in absolute terms and could not, by itself, cause severance. No other changes to the local highway network that could represent a physical barrier are proposed and therefore the impact on severance is low. This is supported by paragraph 3.16 of the IEMA guidance which states that:

"Very low baseline flows are unlikely to experience severance impacts, even with high percentage changes in traffic".

5.4.38 Having regard to the points above, it is concluded that the Proposed Development's effect on severance would be of **negligible or minor** significance.

Non-Motorised User Amenity (including Fear and Intimidation)

5.4.39 The IEMA guidance suggests that a tentative threshold for judging the significance of the effects of traffic on pedestrian and cycle amenity would be where the traffic flow is halved or doubled.

5.4.40 The Proposed Development does result in a doubling of HGV movements on link 2 in the PM peak hour, on links 2 and 3 in the AAWT period, and on links 1, 2, 3 & 4 on Saturdays. However, the actual increase in HGV numbers is low in absolute terms, particularly in the AM and PM weekday peak hours. Furthermore, the overall percentage impact in terms of total vehicles is low on all links in all time periods.

5.4.41 Having regard to the points above, it is concluded that the Proposed Development's effect on non-motorised user amenity would be of **negligible or minor** significance.

5.4.42 With regard to Fear and Intimidation, the IEMA guidance presents a suggested scoring system to help establish the degree of hazard, in order to establish the magnitude of impact by reference to the relative change in the level of fear and intimidation resulting from development traffic.

5.4.43 Based on this scoring system, the Proposed Development would not result in any step change in the level of Fear and Intimidation compared to the baseline, and therefore the magnitude of impact would be negligible.

5.4.44 The effect it on Fear and Intimidation is therefore considered to be of **negligible or minor** significance.

5.5 Cumulative Effects

5.5.1 In addition to the increase in trips caused by the Proposed Development, the total future traffic generation of local committed developments has also been considered. As such the combined traffic flows arising from the Proposed Development and the local committed developments have been considered within the operational traffic assessments as summarised in **Table 4.11**, **Table 4.12**, **Table 4.13** and **Table 4.14**.

5.5.2 With regard to the analysis provided in this Chapter and considering the combination of the Proposed Development and local committed development traffic, it is not expected that there would be any significant cumulative highway-related environmental effects from the developments identified.

5.6 Residual Effects and Conclusions

5.6.1 Given the review of anticipated future operational road conditions and reference to appropriate guidance, it is concluded that the Proposed Development would not result in a significant impact on operational or environmental conditions over the local transport network and there is no requirement for off-site transport improvement / mitigation works.

5.6.2 The impact of trips generated by the proposal have been assessed and it is concluded that in all scenarios, the effects are considered to be **negligible or minor adverse** in nature.

5.6.3 Given the characteristics of the assessed links, which do not accommodate sensitive receptors, it can be concluded that traffic-related environmental effects associated with the Proposed Development are likely to be **negligible or minor adverse** in nature.

ES Appendix 5.1 Transport Statement

Hillhouse IBA Facility

Environmental Statement

Chapter 6.0 - Ecology and Nature Conservation

Prepared for

Fortis IBA Ltd

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CONTENTS

TABLES

APPENDICES

6.0 ECOLOGY AND NATURE CONSERVATION

6.1 Introduction

6.1.1 This Chapter of the ES assesses the potential effects on ecological receptors during the construction and operation of the Proposed Development. A description of the Proposed development is provided at Chapter 4.0.

Competence

6.1.2 This chapter has been written by Simon Holden *BSc (Hons) MCIEEM*. Simon is an Associate Ecologist at Rachel Hacking Ecology Ltd and has 19 years' professional experience, including writing numerous ecological impact assessments. The chapter has been reviewed by Mark Woods *CEcol, MCIEEM*. Mark has 35 years' professional experience.

6.2 Methodology

Legislation and Guidance

European Legislation

6.2.1 The Habitats Directive (92/43/EEC) provides for protection of species of Community interest listed in Annex IV(a) of the Directive ('European Protected Species').

6.2.2 Article 12 of the Habitats Directive sets out the system of strict protection which Member States are required to adopt for animal species listed on Annex IV(a). Article 12(1)(b) prohibits '*deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration*'; Article 12(1)(d) prohibits '*deterioration or destruction of breeding sites or resting places*'.

6.2.3 Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive') provides for the conservation and management of all wild bird species naturally occurring in the European Union, their nests, eggs and habitats.

6.2.4 Article 2 of the Birds Directive provides for the maintenance of populations of wild birds '*at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level*.' Article 4(4) requires that (outside of protected sites) member states '*should strive to avoid pollution or deterioration of habitats*'.

6.2.5 Since the UK left the EU, it is no longer be bound by the above Directives; however, the Conservation of Natural Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') continue to apply, together with relevant Court of Justice of the European Union judgements made before that date. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 were designed to enable the UK to continue to meet its international commitments, such as the Berne and Bonn conventions, and ensure that regulations transposing the EU Habitats and Wild Birds Directives are operable, by making amendments to the Habitats Regulations and other instruments which transpose the Directives into UK law. The purpose of the Directive was not to introduce any changes to the level of site protection derived from EU law, or to change the assessment process.

6.2.6 Regulation 10 of the Habitats Regulations implements provisions in Article 4 of the Birds Directive, requiring competent authorities to 'use all reasonable endeavours' to 'avoid any pollution or deterioration of habitats of wild birds'. Regulations 42 – 44 implement the system of strict protection applied to European Protected Species.

UK Legislation

6.2.7 The Wildlife and Countryside Act 1981 (as amended) provides the principal legislation for designation of nationally important conservation sites and the protection of species. Section 1 provides for protection of birds. Schedule 1 lists bird species with special protection, including protection from disturbance when nesting. Section 9 provides for protection of wild animals listed in Schedule 5. Section 28 provides powers for designation of Sites of Special Scientific Interest (SSSIs), while subsequent amendments, including those enacted by the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006, strengthen the protection of SSSIs.

6.2.8 Section 40 of the Natural Environment and Rural Communities Act 2006 ('NERC Act') sets out the duty of public authorities to conserve biodiversity in the exercise of their functions, through '*having regard, so far as is consistent with the proper exercise of their duties, to the purpose of conserving biodiversity*'. Biodiversity conservation is further defined as including the restoration or enhancement of a population or habitat. Section 41 of the NERC Act requires the Secretary of State to publish a list of species and habitats which are of principal importance for the conservation of biodiversity in England (i.e. 'priority species and habitats'), and to take and promote the taking of "reasonably practicable" steps to further their conservation.

The Environment Act 2021

6.2.9 The Environment Act includes a strengthening of the duties under Section 40 of the NERC Act to require public authorities to enhance as well as conserve biodiversity. It also introduced a mandatory requirement for 10% biodiversity net gain into the planning system.

National Planning Policy Framework

6.2.10 The National Planning Policy Framework 2023 (NPPF) sets out a number of policies for conserving and enhancing the natural environment in Section 15 (paragraphs 170-183). Of particular relevance are the following paragraphs:

i) 170: includes reference to the need to minimise risks to biodiversity and promote net gains for biodiversity where possible, including establishing coherent ecological networks (170 (d));
ii) 171: site protection should be commensurate with their status, and take a strategic approach to maintaining and enhancing habitat networks;
iii) 175: addresses the conservation and enhancement of biodiversity in planning applications;
iv) 177: the presumption in favour of sustainable development does not apply when an Appropriate Assessment under the Habitats Regulations has determined there will be an adverse effect on the integrity of a habitats site;
v) 180: includes policies to consider effects of pollution, including light pollution, on the natural environment.

Local Planning Policy

6.2.11 Consideration of the Proposed Development in the context of development plan policy is undertaken in the separately submitted Planning Statement.

Assessment Methodology

Zone of Influence

6.2.12 The zone of influence (ZoI) refers to the area over which ecological impacts may result. The ZoI can vary for different ecological features, depending on the presence of impact pathways.

6.2.13 For the Proposed Development the ZoI will be mainly limited to the application boundary. However, the ZoI is extended to include adjacent habitats within 200m, due to the potential for effects of emissions on adjacent habitats and for noise and visual disturbance on the qualifying bird features of the adjacent designated sites.

Scope of Assessment

6.2.14 The scope of the assessment was informed by pre-application consultation with Lancashire County Council in March 2024. The scope of the assessment comprises designated sites, protected species, and priority habitats and species[1]

Desk Study

6.2.15 Desk study comprised a search for statutory designated sites, priority habitats and issued European Protected Species mitigation licences using MAGIC[2].

6.2.16 Lancashire Environmental Records network (LERN) was consulted to obtain records of non-statutory designated sites and protected/priority species within 2km.

Field Survey

Extended Phase 1 Habitat Survey

6.2.17 An Extended Phase 1 Habitat Survey was undertaken on 13th December 2023 and again on 25th January 2024 (see Appendix A Preliminary Ecological Appraisal). Habitats were surveyed again using a drone on 17th April 2024 to enable more accurate mapping.

6.2.18 Broad habitat types were recorded and mapped in accordance with standard methodology[3]. A list of characteristic plant species for each vegetation type was

[1] *Habitats and species of principal importance as listed under Section 41 of the Natural Environment and Rural Communities Act 2006.*
[2] *[Magic Map Application (defra.gov.uk)]*
[3] *JNCC (2010) Handbook for Phase 1 Habitat Survey – a technique for rapid environmental audit. Joint Nature Conservation Committee, Peterborough.*

compiled and any invasive species[4] encountered as an incidental result of the survey recorded. The potential for notable species was assessed using professional judgement.

Otter and Water Vole Survey

6.2.19 Royles Brook was surveyed for Otter and Water Vole by Simon Holden and Austin Rigby (Junior Ecologist) on 17th April 2024. Conditions during the survey were dry and clear. Water levels were at normal summer level and visibility was good. The length of Royle's Brook within the red line was walked (waded where possible) and both banks were surveyed for field signs indicating the presence of Otter and Water Vole. Such signs may include:

Otter:

a) Spraint (faeces)
b) Prints
c) Holts/couches (resting sites)
d) Mammal paths/slides

Water Vole:

e) Burrows
f) Latrines/droppings
g) Mammal paths/runs
h) Seeing or hearing Water Voles

Great Crested Newt Assessment

6.2.20 A small body of standing water was recorded during the Extended Phase 1 Habitat Survey. This was sampled on 17th April 2024 for Great Crested Newt eDNA in accordance with standard methodology[5]. Samples were analysed in an approved laboratory.

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[4] Plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). The survey was not specifically aimed at assessing the presence of these species and further specialist advice may need to be sought.
[5] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. Freshwater Habitats Trust, Oxford.

Assessment of Significance / Assessment Criteria

6.2.21 The Chartered Institute of Ecology and Environmental Management (CIEEM) has published guidance for carrying out Ecological Impact Assessment (EcIA)[6]. This includes identifying Important Ecological Features (IEFs), and describing the characteristics, magnitude and direction of significant impacts. The assessment accounts for relevant UK Biodiversity legislation and national and local biodiversity policies.

6.2.22 EcIA is defined in the CIEEM guidelines as 'a process of identifying, quantifying and evaluating the potential effects of development related or other proposed actions on habitats, species and ecosystems'. The CIEEM guidelines stipulate that it is not necessary to carry out a detailed assessment of impacts upon ecological receptors that are sufficiently widespread, unthreatened and resilient to impacts of the proposed development. As such, the assessment considers effects upon ecological receptors which are considered important based on relevant guidance and professional judgement.

6.2.23 Where ecological receptors are not considered sufficiently important to warrant a detailed assessment, or where they would not be significantly affected on the basis of baseline information, these are 'scoped out' of the assessment. Mitigation measures may still be identified as appropriate to avoid/reduce potential adverse effects and to ensure compliance with legal and policy requirements.

6.2.24 A summary of the ecological receptors considered for this assessment, and the rationale for scoping each receptor in or out of detailed assessment is provided in Table 6.1 below.

[6] *CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and marine. Chartered Institute of Ecology and Environmental Management, Winchester.*

Table 6.1 – Ecological features considered within this assessment

Ecological Feature	Scale of Importance	Rationale	Scoping
Statutory designated sites for nature conservation	Up to international	Several overlapping designated sites are present within 50m of the Proposed Development. Effects pathways identified.	**Scoped in**
Non-statutory designated sites for nature conservation	County	Non-statutory designated sites are present within 50m. Effects pathways identified.	**Scoped in**
Notable/Priority habitats (off-site)	Up to county	Priority habitats associated with the Wyre Estuary are present within 50m of the Proposed Development. Effects pathways identified.	**Scoped in**
Habitats on site	Site to local	Habitats within the boundary of the Proposed Development are common, widespread and of lower ecological importance.	Scoped out
Amphibians	Site	Habitats on site are unlikely to support important populations/assemblages. Great Crested Newt absence determined through eDNA analysis.	Scoped out
Reptiles	Site	Habitats on site are sub-optimal and unlikely to support important populations/assemblages.	Considered in relation to legal protection only.
Birds (breeding)	Site	Habitats on site are unlikely to support rare species or important assemblages of breeding birds.	Considered in relation to legal protection only.
Birds (passage and wintering)	Up to international	Although habitats on site are not important, adjacent statutory designated sites are designated for their importance to passage and wintering birds.	**Scoped in**
Badger	N/A	No evidence of Badgers using the site. Badgers are common and widespread; legal status is primarily designed to prevent persecution.	Considered in relation to legal protection only.
Bats (roosting)	N/A	Features on site offer negligible potential to support roosting bats.	Scoped out
Bats (foraging/commuting)	Site	Habitats on site are of low suitability for foraging and commuting bats and are unlikely to be important in maintaining the favourable	Scoped out

		conservation status of any local populations.	
Otter and Water Vole	Local	Suitable habitat present on Royles Brook, adjacent to the site. Evidence of Otter recorded.	Considered in relation to legal obligations only.
Hedgehog	Site	Limited habitat suitability on site. Significant effects are unlikely.	Scoped out
Invasive non-native species	N/A	Very small areas of invasive non-native species recorded on site.	Considered in relation to legal obligations only.

6.2.25 EcIA includes the following stages:

i) Identification and evaluation of Important Ecological Features (IEFs);
ii) Identification and characterisation of impacts on IEFs;
iii) Identification of mitigation measures to avoid and reduce significant impacts;
iv) Assessment of the significance of any residual effects after such measures;
v) Identification of appropriate compensation measures to offset significant residual effects; and
vi) Identification of appropriate opportunities for biodiversity enhancement (net gain)

6.2.26 The term 'impact' refers to actions resulting in changes to an ecological feature, e.g. removing a hedgerow; and the term 'effect' refers to the changes to an ecological feature resulting from an impact, e.g. a reduction in population due to reduced nesting habitat.

6.2.27 Once identified, potential impacts are characterised as appropriate: positive or negative, extent, magnitude, duration, timing, frequency and reversibility.

Identifying Impacts and their Effects

6.2.28 The EcIA process identifies and characterises impacts and considers mitigation options. The significance of any impact will be determined by assessing the residual impact after mitigation measures are applied.

6.2.29 CIEEM defines positive effects as 'beneficial' and negative effects as 'adverse':

i) Positive/Beneficial – change that improves the quality of the environment such as an increase in species population or diversity, extending or enhancing the condition of a habitat, or improving water/air quality. Reversing or halting declines in the quality of the environment are also positive.

ii) Negative/Adverse – change that causes declines in the quality of the environment such as destruction, degradation, fragmentation and pollution of habitats, loss of species diversity and resources for a species.

6.2.30 For each impact it is necessary to determine the magnitude and probability. The magnitude of impacts can be categorised as major, moderate, minor or neutral (see Table 6.2).

Table 6.2 – Impact magnitude and effects on IEFs

Impact Magnitude	Effects
Major	Large-scale, permanent changes to an IEF that will affect ecological integrity. Changes to the conservation status of a species or habitat type are likely.
Moderate	Medium-scale permanent changes or larger-scale temporary changes that do not alter the integrity of the feature. Temporary (and reversible) changes in the conservation status of a species or habitat.
Minor	Small-scale permanent or medium-scale temporary changes, with no affect to integrity. The conservation status of a species or habitat is unlikely to change.
Negligible	Change to the IEF is imperceptible.

6.2.31 The probability of the impact is qualitatively assessed unless there is certainty as a consequence of targeted quantitative analysis (see Table 6.3).

Table 6.3 – Impact certainty

Criteria	Probability
Certain / Near-certain	Effects will occur as a result of the proposals
Probable	Effects are more likely to occur than not occur
Unlikely	Effects are less likely to occur than to occur
Extremely Unlikely	Effects are very unlikely to occur

Impact Significance

6.2.32 Any effect that causes a decline in the integrity of an IEF is significant. Effects can be significant at a range of geographic levels from international to site level. However, to be classed as significant in EIA terms, effects must be significant at the county level or higher. It is important to recognise that a significant effect is not necessarily a reason to refuse planning permission.

6.2.33 In the context of EIA, determining the significance of an impact involves considering both the magnitude of the impact and the sensitivity of the affected receptor (see Table 6.4).

Table 6.4 – Impact significance

Impact Significance	Impact Magnitude
Major Adverse	Considerable detrimental effect to IEFs of county level importance or higher. Significant.
Moderate Adverse	Limited detrimental effect which can be significant.
Minor Adverse	Slight, temporary, or localised, detrimental effect. Not significant.
Neutral	No determinable effect. Not significant.
Minor Beneficial	Slight, temporary, or localised, positive effect. Not significant.
Moderate Beneficial	Limited positive effect which can be significant.
Major Beneficial	Considerable positive effect to IEFs of county level importance or higher. Significant.

Limitations

6.2.34 Surveys were undertaken under suitable conditions at an appropriate time of year. The initial habitat surveys were undertaken during winter months when many plant species have died-back. However, re-survey in April informed a robust assessment and a high degree of confidence is placed on the conclusions of the assessment.

6.3 Baseline and Evaluation

Statutory Designated Sites

6.3.1 Statutory designated sites within the study area are listed in Table 6.5.

Table 6.5 – Statutory designated sites

Name	Status	Location/distance	Interest
Morecambe Bay	Ramsar site	30m northwest	Estuarine and intertidal habitats. Internationally important wildfowl and wintering waterbird populations.
Morecambe Bay and Duddon Estuary	Special Protection Area (SPA)	30m northwest	Internationally important wildfowl and wintering waterbird populations.

Wyre-Lune	Marine Conservation Zone (MCZ)	30m northwest	Smelt.
Morecambe Bay	Special Area for Conservation (SAC)	5.5km north	Intertidal and coastal habitats. Great Crested Newt.
Wyre Estuary	Site of Special Scientific Interest (SSSI)	30m northwest	Estuarine habitats including extensive saltmarsh and mudflats. Wintering and passage Black-tailed Godwit, wintering Turnstone and Teal.

6.3.2 Morecambe Bay Ramsar site, SPA and SAC and Wyre-Lune MCZ are of **international importance**.

6.3.3 Wyre Estuary SSSI is of **national importance**.

Non-statutory Designated Sites

6.3.4 Non-statutory designated sites within the study area are listed in Table 6.6.

Table 6.6 – Non-statutory Designated Sites

Name	Status	Location/distance	Interest
ICI Hillhouse Estuary Banks	Biological Heritage Site (BHS)	Adjacent to northwest	Scrub, dry reedbed, tall herb and grassland.
Fleetwood Railway Branch Line – Trunnah to Burn Naze	BHS	700m west	Former railway line supporting species rich open habitats, grassland and scrub.
Skippool Marsh and Thornton Bank	BHS	1.4km southeast	Ungrazed saltmarsh and relict woodland. Lax-flowered Sea-lavender and Wild Celery.
Burglars Alley Field	BHS	1.7km northwest	Upper saltmarsh transitional habitats. Water vole.
Fleetwood Farm Fields	BHS	1.9km northwest	Agricultural fields used by large numbers of Pink-footed Goose, also roosting Lapwing and Oystercatcher. Brackish Water-crowfoot recorded on a pit margin.

6.3.5 Non-statutory designated sites are of ecological importance at the **county level**.

Habitats

6.3.6 A summary of the habitats and key features within the Proposed Development boundary is provided below.

6.3.7 The Site comprises two parcels of land, intersected by Royles Brook. The main parcel to the north of the brook extends to approximately 3ha. A smaller parcel to the south of the brook extends to approximately 0.7ha. The topography of the Site is flat. The Site was formerly a chemical plant. The plant was demolished down to slab level between October 2020 and May 2022 and the Site is now dominated by gravel and hardstanding, the former supporting short ephemeral vegetation. Typical species include Black Medick, Ribwort Plantain, Selfheal, Birds-foot Trefoil and Wild Thyme.

6.3.8 Small areas of rank species poor grassland and scattered scrub are present around the peripheries. Typical species comprise Yorkshire Fog, Cock's-foot, Canary-grass, Wild Carrot, Evening Primrose and Bramble.

6.3.9 Dense mixed scrub is present along the banks of Royle's Brook and along the embankment at the northeast boundary. Dominant species comprise Butterfly Bush, Bramble, Blackthorn, Hawthorn and Sea Buckthorn. A small stand of Japanese Rose is present along the northwestern boundary. This is an invasive non-native species[7].

6.3.10 Buildings on site comprise former offices in the north and a small, prefabricated structure in the south.

6.3.11 A small concrete pit (approximately 2m x 2m) containing standing water is present in the south. The water is approximately 0.6m deep with a silt substrate. Some Bulrush is present.

6.3.12 Outside of the boundary of the Proposed Development, but between the two parcels of land, Royle's Brook is a slow-flowing water course flowing northwest to southeast towards the Wyre Estuary. The channel is on average 2m wide and heavily modified with re-sectioned banks, a straightened course and several culverts. The substrate is silt and aquatic vegetation is almost entirely absent.

6.3.13 The site does not support any Habitats of Principal Importance. The short ephemeral vegetation is reasonably species-rich but does not qualify as Open Mosaic on Previously Developed Land. Habitats on site are of ecological importance at the **site**

[7] *As listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).*

level. Royle's Brook provides connectivity to the Wyre Estuary and is of ecological importance at the **local level**.

Baseline Biodiversity Units

6.3.14 The baseline biodiversity units are shown in Table 6.7. Refer to the Defra Statutory Biodiversity Metric spreadsheet and Statutory Biodiversity Metric Condition Assessment spreadsheets for further details.

Table 6.7 – Baseline biodiversity units

Phase 1 Habitat Classification	UK Hab Classification	Area (Ha)	Biodiversity Units
Ephemeral/short perennial	Sparsely vegetated land; ruderal/ephemeral	2.1	8.4
Buildings and hardstanding	Urban; developed land, sealed surface	0.94	0.00
Dense scrub	Heathland and shrub; mixed scrub	0.267	2.14
Bare ground	Artificial; developed land, unsealed surface	0.251	0.00
Semi-improved grassland	Other neutral grassland	0.138	1.1
Tall ruderal herb	Sparsely vegetated land; ruderal/ephemeral	0.031	0.13
Standing water	Ornamental lake/pond	0.001	0.00
Total		**3.73**	**11.77**

Fauna

Invertebrates

6.3.15 Numerous records of invertebrates, including species of principal importance were returned. The range of habitats provides resources for a range of species, but the topography of the site is largely flat, limiting the availability of microhabitats. Habitats on site are unlikely to support an important invertebrate assemblage.

6.3.16 The site is of ecological importance at the **site level** for invertebrates.

Amphibians

6.3.17 Numerous records of Great Crested Newt were returned, the most recent being from 2017. The records all relate to ponds over 500m southeast of the site, or on the opposite side of the Wyre Estuary.

6.3.18 The small body of standing water on site tested negative for Great Crested Newt eDNA. Common Frog and Smooth Newt were recorded using this feature. Both these species are common and widespread.

6.3.19 The amphibian assemblage using the site is of ecological importance at the **site level**.

Reptiles

6.3.20 A single record of Common Lizard was returned from 1.8km northwest of the site (2006).

6.3.21 Habitats on site are sub-optimal for reptiles due to the largely flat topography and very sparse vegetation cover offering little structural diversity. The site is unlikely to be important in maintaining any reptile populations.

6.3.22 The site is of ecological importance at the **site level** for reptiles.

Birds

6.3.23 Numerous bird records were returned; most originated from a ringing area 1.4km northwest of the site, or from Wyre Estuary Country Park 500m southeast of the site. The site is within the Pink-footed Goose major feeding zone, but habitats on site are not suitable for this species, which uses agricultural fields.

6.3.24 Habitats on site are of limited interest for birds. The dense scrub along the northeastern boundary and adjacent to Royles Brook offers suitable nesting habitat for a range of common bird species. Habitats on site are not suitable for the qualifying bird species of the statutory designated sites within the study area, which require a range of coastal and estuarine habitats. The site does not represent functionally linked land.

6.3.25 Habitats on site are of importance at the **site level** for birds.

Badger

6.3.26 No records of Badger were returned.

6.3.27 The densely vegetated embankment adjacent to the eastern boundary offers suitable habitat for commuting and setts but no evidence of Badger was recorded during the survey. Habitats on site are generally unsuitable for Badger.

6.3.28 The site is of **negligible** ecological importance for Badger.

Bats

6.3.29 Records returned included Common Pipistrelle, Soprano Pipistrelle and Brown Long-eared bat.

6.3.30 The buildings on site offer negligible potential to support roosting bats due to the absence of suitable features. The trees on site offer negligible potential to support roosting bats due to the absence of suitable features.

6.3.31 Habitats on site are generally open and exposed. The vegetated corridor of Royle's Brook and the densely vegetated embankment along the northeastern boundary offer suitable habitats for foraging bats.

6.3.32 The site is of ecological importance at the **site level** for bats.

Otter

6.3.33 No records of Otter were returned.

6.3.34 Habitats on site are not suitable for Otter. Evidence of use by Otter (a print and a fresh spraint) was recorded during the survey of Royle's Brook. Royle's Brook offers a source of fresh water for Otters and is likely used for commuting and occasional foraging. No resting sites were recorded, and it is unlikely to be an important resource for the local population. The Wyre Estuary offers suitable foraging and commuting habitat for Otter.

6.3.35 The site is of ecological importance at the **site level** for Otter.

Water Vole

6.3.36 Several records of Water Vole were returned, although most were around 20 years old. The closest record is from 65m southeast of the site (2016). Most records are associated with ditches in Burglar's Alley Field, 1.7km northwest of the site.

6.3.37 Habitats on site are not suitable for Water Vole. Royles Brook offers limited potential to support this species, due the sparse level of aquatic and riparian vegetation, and the presence of culverts, but no evidence was identified during the survey.

6.3.38 The reach of Royle's Brook running through the site is of ecological importance at the **site level** for Water Vole.

Hedgehog

6.3.39 Several records of Hedgehog were returned.

6.3.40 The site offers suitable commuting and foraging habitats for Hedgehog.

6.3.41 The site is of ecological importance for Hedgehog at the **site level**.

Future Baseline

6.3.42 If the Proposed Development were not to be delivered, the baseline conditions at 2026 would probably be very similar. Scrub, particularly Butterfly Bush, is likely to continue to colonise open habitats. The faunal assemblage is unlikely to change significantly.

6.4 Assessment of Effects

Embedded Mitigation

Construction

6.4.1 Embedded mitigation refers to measures that will be incorporated within the Proposed Development, not specifically to mitigate ecological impacts. Impact assessment is made assuming that embedded mitigation measures are applied.

6.4.2 The construction programme will restrict activities with potential to result in disturbance from noise and vibration impacting qualifying features of the protected sites associated with the Wyre Estuary. It is proposed that no percussive piling works shall take place between November and February (inclusive).

Operation

6.4.3 The design has considered the sensitivity of the adjacent Wyre Estuary and the habitats and fauna it supports. Noise during the operational phase will be minimised through the embedded mitigation measures set out in Chapter 7.0. This includes measures such as use of acoustically insulated cladding and mobile plant and vehicles being fitted with non-tonal reversing alarms. Full details of noise mitigation measures are provided in Chapter 7.0.

6.4.4 Dust control measures are included within a Dust Management Plan, which is submitted with the application. This includes damping down ash during storage and transport.

6.4.5 A sensitive lighting scheme will ensure that artificial lighting during the operational phase does not spill onto adjacent habitats within the Wyre Estuary or along Royles Brook.

Construction Phase Impacts

6.4.6 The construction phase will include site clearance and enabling works. It is assumed that all habitats on site will be lost, although small areas may be retained. Construction of the IBA facilities is expected to take approximately 16 months to complete.

6.4.7 Potential impacts during the construction phase include:

i) Habitat loss
ii) Disturbance of wildlife due to noise and visual impacts
iii) Pollution from dust, emissions, chemicals or surface water runoff affecting IEFs

Statutory Designated Sites

6.4.8 The proposed development will not result in any direct impacts due to habitat loss. This is a **negligible** impact. Confidence in this assessment is very high.

6.4.9 Noise and vibration during construction could result in disturbance to the qualifying features of the Wyre Estuary protected sites. Birds could be displaced from feeding and roosting grounds and may expend additional energy. These impacts can result in reduced survival rates.

6.4.10 The timing of the construction programme will avoid the risk of disturbance from noise and vibration affecting qualifying bird features. High volume activities will be restricted to avoid November to February, thus avoiding the passage and wintering periods. It is possible that small numbers of birds may be disturbed on a temporary short-term basis. The potential for disturbance to affect a significant number of qualifying bird species (0.5% of the GB population or greater than 1,000 individuals[8]) is considered very unlikely. This would be a short-term, temporary effect at the local level **(minor adverse)**. Confidence in this assessment is high.

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[8] *As defined in Natural England publication Identification of Functionally Linked Land supporting Special Protection Areas (SPAs) waterbirds in the North-West of England (NECR361).*

6.4.11 The potential for visual disturbance to qualifying bird features of the adjacent Wyre Estuary during construction is not considered likely as the presence of the existing bund will provide a degree of screening. The storage and processing buildings will be 15m and 17m high respectively. However, they are in keeping with the scale of other industrial structures on the wider site.

6.4.12 There is a path between the Site and the Wyre Estuary, so birds will be habituated to a degree of anthropogenic activity (dog walking is widely recognised as one of the recreational activities most likely to displace feeding/roosting birds). It is also acknowledged that birds (and most wildlife) become habituated to regular, non-threatening, predictable sources of disturbance.

6.4.13 Given the public right of way and the industrial nature of the Enterprise Zone in which the Site is located, visual disturbance of birds using the estuary is considered very unlikely.

6.4.14 Visual impact disturbance is assessed as being a short-term, temporary effect at the local level **(minor adverse)**. Confidence in this assessment is high.

6.4.15 Pollution during construction could potentially reach the Wyre Estuary as Royles Brook provides an impact pathway. The control measures included within a CEMP will avoid this risk. The risk of waterborne pollution affecting the qualifying features of the Wyre Estuary protected sites is unlikely.

6.4.16 Dust emissions during earthworks will be controlled by measures included within a CEMP. The Air Quality Chapter assesses the risk of impacts to coastal saltmarsh as not significant.

6.4.17 The impact of exhaust emissions from vehicles during construction is assessed as negligible in the Air Quality Chapter. Unlike some habitats, saltmarsh is not adversely affected by increased nitrogen levels.

6.4.18 Overall, impacts to statutory designated sites from adverse changes to air quality are assessed as **negligible**. Confidence in this assessment is high.

Non-statutory Designated Sites

6.4.19 ICI Hillhouse Estuary Banks BHS is the only non-statutory site within the ZoI. Impacts to other sites are very unlikely due to the distance and absence of impact pathways.

6.4.20 There will be no direct impacts due to habitat loss. Fencing will prevent incursion into the habitats within the BHS. The measures described above will avoid impacts from dust pollution affecting habitats. Any effects to the BHS would be short-term and temporary **(minor adverse)**. Impacts affecting the integrity of the site are very unlikely. Confidence in this assessment is very high.

Habitats

6.4.21 During the construction phase habitats will be lost to facilitate construction. It is assumed that all the habitats on the site will be lost. The likelihood of the impact is certain. This will be a single event resulting in a permanent adverse impact significant at the site level **(minor adverse)**. Confidence in this assessment is very high.

Operational Phase Impacts

6.4.22 Potential impacts during the operational phase include:

i) Airbourne emissions
ii) Surface water runoff carrying pollutants
iii) Disturbance from noise; and
iv) Light spill

Statutory Designated Sites

6.4.23 Impacts due to dust and vehicle exhaust emissions during the operational phase are assessed in the Air Quality Chapter as being **negligible**.

6.4.24 The surface water drainage strategy described in Chapter 5 states that water draining from bays and building roofs will be stored in above-ground tanks for re-use. Surface water from hardstanding will discharge to a catchpit before being conveyed to above-ground storage tanks. It will be re-used to wet the stored ash. Residual surface water will discharge to Royles Brook at a reduced rate from the baseline.

6.4.25 Foul water from the offices and weighbridge area will be treated on the Site and discharged to Royles Brook.

6.4.26 Overall, impacts to statutory designated sites from surface water effects are assessed as being **negligible**.

6.4.27 Overall, impacts to statutory designated sites from adverse changes to air quality during the operational phase are assessed as **negligible**. Confidence in this assessment is high.

6.4.28 In line with the Waterbird Disturbance Mitigation Toolkit[9], a low threshold of 55dB has been used, as studies indicate noise below this level generally elicits no response and is unlikely to cause a response in birds using a fronting intertidal area. Noise and vibration impacts on the ecological sensitive receptors have been assessed and mitigation measures detailed to minimise and control noise and vibration have been provided for the construction and operation periods. The assessment shows that there would be no significant impacts resulting from noise or vibration during the construction, operation or de-commissioning of the Proposed Development, following the implementation of appropriate mitigation.

6.4.29 Disturbance from noise during the operational phase is assessed as a **negligible** effect.

6.4.30 Increased artificial light has the potential affect feeding and roosting birds using intertidal areas. It can also increase the risk of predation from raptors. Low intensity lighting will be required for the safe operation of the Proposed Development; this will be directed downwards and away from the site boundaries. Effects from lighting during operation are assessed as being **negligible**.

Non-statutory Designated Sites

6.4.31 No impacts to the adjacent BHS are anticipated during the operational phase.

Decommissioning Phase

6.4.32 The planning application seeks full and permanent planning permission for the Proposed Development. At a time when decommissioning is considered appropriate, a detailed decommissioning plan and assessment will be prepared prior to decommissioning of the Proposed Development. The impacts of decommissioning cannot be assessed in detail at this stage, as factors such as best-practice methods and guidance and the sensitivity of the area may change by the time decommissioning is planned. However, the potential impacts during

[9] *https://www.tide-toolbox.eu/tidetools_waterbird_disturbance_mitigation_toolkit/*

decommissioning are anticipated to be similar to those during construction. Demolition will be required, which will be undertaken using measures to minimise noise and dust emissions. Similarly to the construction phase, with appropriate control measures the residual impacts will be **negligible** and the effect **not significant**.

6.5 Cumulative Effects

6.5.1 Four other developments have been considered in the assessment of potential cumulative effects.

6.5.2 20/00405/LMAJ - The erection of 210 residential dwellings on land off Bourne Road: No significant residual effects were identified for this development, which was not subject to EIA.

6.5.3 19/00347/FULMAJ - A hybrid planning application consisting of full planning permission for the erection of 41 dwellings and outline permission for up to 45 dwellings and 42 apartments (all matters reserved except for access) at the site of the Thornton-Cleveleys Football Club: no significant ecological impacts were identified for this development, which was not subject to EIA.

6.5.4 23/01214/LCC - Proposed development of an Energy Recovery Centre and associated infrastructure (LCC/2023/0003): no significant adverse ecological effects were identified in the ES for this development.

6.5.5 22/00762/FULMAJ - Proposed erection of 160 new dwellings on land located to the west of Fleetwood Road North, Thornton Cleveleys: no significant adverse ecological effects were identified for this development, which was not subject to EIA.

6.5.6 No developments have been identified which could give rise to likely significant environmental effects in combination with the Proposed Development.

6.6 Mitigation

6.6.1 Potential impacts have largely been avoided through design of the Proposed Development, however where negative impacts cannot be avoided, additional mitigation may be required as outlined below. This section also includes mitigation measures required to ensure legislative compliance.

Construction Mitigation

6.6.2 A suitably qualified ecologist will be commissioned prior to the commencement to act as Ecological Clerk of Works (ECoW). The ECoW will be responsible for providing appropriate ecological advice where required.

6.6.3 The ECoW will be responsible for undertaking and / or co-ordinating checks for protected species before construction and decommissioning activities commence. The ECoW will also maintain a watching brief as necessary throughout construction and any future decommissioning phase to ensure compliance with relevant legislation.

6.6.4 Should any invasive species be encountered on Site prior to or during construction, the advice of a suitably qualified ecologist should be sought and the appropriate measures taken.

6.6.5 Measures to protect ecological features will be included within a Construction Environmental Management Plan (CEMP).

6.6.6 Standard pollution control measures will include safe storage and use of fuel and other chemicals, use of silt fences, spill kits, and noise and dust suppression measures to minimise the risk of impacts to habitats and wildlife.

6.6.7 A sensitive lighting scheme will ensure that artificial lighting during construction does not spill onto habitats within the Wyre Estuary or along Royles Brook.

6.6.8 Retained habitats, including Royles Brook, will be protected from damage through intrusion by suitable fencing.

Biodiversity Net Gain Assessment

6.6.9 The assessment predicts the loss of 11.77 biodiversity units associated with the Proposed Development. No irreplaceable habitats are present on site. To achieve the mandatory 10% net gain will require 12.95 units.

6.6.10 The Application will achieve biodiversity net gain through biodiversity offsetting options, subject to agreement with LCC and delivered via a suitably worded planning condition.

6.6.11 The general measures described under the following subheadings will be undertaken in addition to those included by design.

Amphibians and Reptiles

6.6.12 Removal of suitable habitat for amphibians and reptiles will be undertaken in accordance with a method statement to minimise the risk of harm.

Birds

6.6.13 Removal of woody vegetation will be timed to avoid the nesting season (March to September). If this is not possible, a nesting bird survey will be undertaken by a suitably qualified ecologist. Any active nests will be protected by a suitable buffer until nesting is complete.

Bats

6.6.14 Any lighting during construction will be designed to avoid lightspill onto suitable bat foraging habitats along the northeastern boundary and along Royles Brook.

Otter and Water Vole

6.6.15 A pre-construction survey of Royles Brook will be undertaken before construction commences. If evidence of Otter resting sites or Water Vole burrows is discovered within 30m of construction areas, suitable protection and avoidance measures will be adopted in line with the advice of an ecologist. If necessary, such works may proceed under a mitigation licence from Natural England.

Invasive Non-native Species

6.6.16 A method statement will address the risk of spreading invasive non-native species (Japanese Rose) during construction.

Operational Mitigation

6.6.17 No additional mitigation is considered necessary during the operational phase. Impacts have been addressed as far as reasonably practicable through avoidance and the embedded mitigation within the design of the Proposed Development.

6.6.18 Table 6.8 summarises how the mitigation measures will be delivered as part of the planning process.

Table 6.8 Mechanism for mitigation delivery

Mitigation measures	Mechanism for delivery		
	By design	S.106	By condition
Avoidance and protection of sensitive adjacent protected sites and habitats	X		
Avoidance of disturbance to qualifying bird features of adjacent protected sites	X		
Compensatory habitat creation/enhancement to achieve 10% Biodiversity Net Gain		X	
Appointment of ECoW			X
Pre-construction for Otter and Water Vole to inform mitigation requirements			X
CEMP to include measures to minimise noise, dust and lighting impacts and risks to amphibians and reptiles during construction.			X

6.7 Residual Effects and Conclusions

6.7.1 Residual effects are summarised in Table 6.9.

Table 6.9 Residual effects

Ecological feature	Impact before mitigation	Impact after mitigation	Significance
Construction Phase			
Statutory Designated Sites			
Habitat loss	Negligible	Negligible	Not significant
Noise disturbance to qualifying features	Minor adverse	Minor adverse	Not significant
Visual disturbance to qualifying features	Minor adverse	Minor adverse	Not significant
Waterborne pollution	Minor adverse	Negligible	Not significant
Dust/emissions	Minor adverse	Negligible	Not significant
Non-statutory Sites			
Habitat loss	Negligible	Negligible	Not significant
Dust/emissions	Minor adverse	Negligible	Not significant
Priority Habitats (off site)			
Habitat loss	Negligible	Negligible	Not significant
Dust/emissions	Minor adverse	Negligible	Not significant
Operational Phase			
Statutory Designated Sites			
Noise disturbance to qualifying features	Negligible	Negligible	Not significant
Visual disturbance to qualifying features	Negligible	Negligible	Not significant
Waterborne pollution	Negligible	Negligible	Not significant
Dust/emissions	Minor adverse	Negligible	Not significant
Non-statutory Designated Sites			
No impacts anticipated			Not significant

ES Appendix 6.1 – Preliminary Ecological Appraisal

Hillhouse IBA Facility

Environmental Statement

Chapter 7.0 – Noise

Prepared for

Fortis IBA Ltd

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7.0 NOISE

7.1 Introduction

7.1.1 This Chapter assesses the likely significant environmental effects of the Proposed Development in terms of noise. It describes the methods used to assess the effects, the existing sound climate and the assessment of future baseline sound levels in the vicinity of the Site. In addition, the potentially affected noise sensitive receptors (NSR) are identified. The chapter sets out direct and indirect likely significant effects arising from the construction and operation of the Proposed Development and provides details of mitigation measures to minimise noise.

7.1.2 The assessment includes:

i) A description of the existing sound environment;
ii) An outline of the likely evolution of the future baseline sound levels;
iii) Identification of those aspects of the Proposed Development that may cause noise and vibration effects;
iv) Predictions of noise and vibration levels during the operational phase upon the NSR;
v) Details of potential cumulative effects where noise from other potential developments may also affect the same NSR; and
vi) Likely residual significant effects taking account of proposed mitigation.

7.1.3 Potential noise effects are considered in the context of the predicted background sound levels at NSR, which at this location are generally influenced by local road traffic, Business Park noise activities and birdsong.

7.1.4 Appendix 7.1 provides details of technical terms used within the chapter. There is also a chart showing typical everyday noise levels to assist in understanding the subjective level of noise in terms of decibels (dB).

Future Baseline

7.1.5 This assessment has considered the existing residual background and ambient sound levels at NSR and compares this against the Proposal to determine the future baseline scenarios and impacts. The future baseline scenario also considers any potential cumulative effects from other proposed development in the area that may have an effect.

Proposed Development

7.1.6 A full description of the Proposed Development is provided in Chapter 4.0 of this ES Main Report Volume 1. The application site's location and context are provided in Chapter 1.0 of this ES. The Site is located within the Hillhouse Enterprise Zone, Thornton-Cleveleys, located to the south-east of the town of Fleetwood and on the western banks of the River Wyre Estuary. The location of the Site is shown on Drawings 3566-01-01 and 3566-01-02.

7.1.7 The Site comprises an area of previously developed 'brownfield' land. There are internal roadways and two buildings (a control room and a one storey office building) remaining from the PVC manufacturing facility which previously occupied the Site.

7.1.8 There are two main parts/sections to the Site with the first being a larger area of land set between the River Wyre (to the northeast) and Royles Brook (to the south west), and the second being a smaller parcel set to the south west of Royles Brook, with these pieces of land linked by a culvert crossing over Royles Brook.

7.1.9 The Site is bound:

i) to the north-east by a public right of way ('PRoW'), with the River Wyre beyond;
ii) to the south and south-east by an area of woodland, beyond which is Flint's Caravan Park and the Stanah Substation; and
iii) to the west and north-west by the remainder of Hillhouse International Enterprise Zone, comprising various employment and industrial uses, and vacant pieces of brownfield land.

7.1.10 The Site is accessed by a private road (South Road), which connects to other private estate roads within the Hillhouse International Enterprise Zone. Access to the Hillhouse International Enterprise Zone is provided via Bourne Road (a Gatehouse and weighbridge are located at the entrance to the Enterprise Zone), which connects to the nearest adopted highway (Fleetwood Road North) to the north-west of the Enterprise Zone.

7.1.11 The Proposed Development would operate 24 hours per day and 7 days per week (except during a night-time period 2300-0700 hours on a Saturday into a Sunday morning). Deliveries would be brought to the facility between the hours of 06.00 and 19.00 six days a week (Monday to Saturday) and no deliveries on Sundays or Bank Holidays.

7.1.12 A sound survey has been carried out in the vicinity of the operational Sites to determine existing representative background and residual sound levels. The aim of the sound survey was to:

i) Identify the existing baseline sound levels for use as a reference for background and residual sound levels in the assessment of impacts related to the construction and operation of the Proposed Development;
ii) Enable the assessment baseline to be established and understand the effects of existing developments on the future baseline; and
iii) Characterise the nearest NSR or noise sensitive sites.

7.1.13 The methodology and approach to the sound survey and assessment included the following:

a) Establishing the nearest NSR;
b) Evaluation and assessment of present and assessment background and ambient sound levels;
c) Evaluation of noise sources from the Proposed Development in terms of typical operating levels;
d) Assessment of specific noise sources in relation to appropriate guidance and standards (e.g. BS4142: 2014+A1:2019, BS8233: 2014); and
e) Identification of any additional noise control necessary (beyond the inherent mitigation measures) where noise generated from the Proposed Development has been identified as exceeding noise limits or would have the potential to cause a significant increase in noise levels from the assessment baseline.

7.1.14 The noise assessment has benefited from pre-application submissions to enable agreement to be made with the Local Authority on the approach to assessment methodology and noise criteria.

Competence

7.1.15 The author of this assessment has over 40 years' experience in the field of industrial and environmental acoustics with a Masters' Degree in Acoustics and is a Member of the Institute of Acoustics, Member of the Association of Noise Consultants, Member of the Academy of Experts and an Incorporated Engineer.

7.2 Methodology

Legislation and Guidance

General

7.2.1 To establish the impact of the Proposed Development in respect of noise on existing or proposed residential receptors it is necessary to consider the relevant noise guidance, standards and policy for an industrial development. The following section examines the guidance and establishes the methodology to be adopted for assessing noise impacts.

7.2.2 Information used in this assessment has been obtained from the following sources:

a) Ordnance Survey maps of the local area;
b) General layout of the Proposal;
c) National Planning Policy Framework (NPPF) [1] (December 2023);
d) Noise Policy Statement for England (NPSE) [2] (March 2010);
e) National Planning Practice Guidance (NPPG) [3] (June 2021);
f) Environment Agency Noise and Vibration Management: Environmental Permits [4] (January 2022);
g) BS4142:2014+A1:2019 Method for Rating Industrial Noise affecting Mixed Residential and Industrial Areas [5];
h) BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings[6];

[1] *Ministry of Housing, Communities & Local Government: National Planning Policy Framework (December 2023).*
[2] *Department for Environment, Food & Rural Affairs (March 2010): Noise Policy Statement for England.*
[3] *Ministry of Housing, Communities & Local Government: National Planning Practice Guidance (June 2021) – Noise (July 2019) & Minerals (October 2014).*
[4] *Environment Agency – Guidance: Noise and vibration management: environmental permits 31 January 2022.*
[5] *BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound'.*
[6] *BS 8233: 2014 `Guidance on sound insulation and noise reduction in buildings.*

i) BS5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites [7];
j) Highways England Design Manual for Roads and Bridges: LA111 Noise and vibration (May 2020) Rev 2 [8];
k) World Health Organisation: Guidelines for Community Noise [9] (April 1999);
l) World Health Organisation Night Noise Guidelines for Europe'[10] (2009);
m) ISO 9613-2:1996 Acoustics: Attenuation of Sound During Propagation Outdoors[11];
n) Department of Transport Calculation of Road Traffic Noise[12] (1988);

Assessment Methodology

National Planning Policies

The National Planning Policy Framework (NPPF) December 2023

7.2.3 Chapter 15 of the National Planning Policy Framework (NPPF) relates to 'Conserving and enhancing the natural environment'.

7.2.4 Paragraph 180 e) refers directly to noise and states that: *"e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;"*

7.2.5 Paragraph 191 also states: *"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*

[7] *BS 5228-2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites' – Part 1: Noise & Part 2: Vibration*
[8] *Highways England Design Manual for Roads and Bridges (May 2020) LA 111 Noise and vibration (Rev 2).*
[9] *World Health Organisation (WHO): 'Guidelines for Community Noise' (1999).*
[10] *World Health Organisation (WHO): 'Night Noise Guidelines for Europe' (2009).*
[11] *ISO 9613-2: 1996 Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2 General Method of Calculation.*
[12] *Department of Transport `Calculation of Road Traffic Noise': 1988*

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."*

Noise Policy Statement for England (NPSE) March 2010

7.2.6 The Noise Policy Statement for England (NPSE) was published in March 2010. It specifies the following long-term vision and aims: *"Noise Policy Vision: Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:*

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

i) *Avoid significant adverse impacts on health and quality of life;*
ii) *Mitigate and minimise adverse impacts on health and quality of life; and*
iii) *Where possible, contribute to the improvement of health and quality of life."*

7.2.7 The NPSE introduced three concepts to the assessment of noise, as follows:

NOEL – No Observed Effect Level: This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.
LOAEL – Lowest Observable Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected.
SOAEL – Significant Observed Adverse Effect Level: This is the level above which significant adverse effects on health and quality of life occur.

7.2.8 The above categories are undefined in terms of noise levels and for the SOAEL the NPSE indicates that the noise level will vary depending upon the noise source, the receptor and the time of day / day of the week, etc. More research is therefore required to establish what may represent a SOAEL. It is acknowledged in the NPSE that not stating specific SOAEL levels provides policy flexibility until there is further evidence and guidance.

7.2.9 The NPSE indicates how the LOAEL and SOAEL relate to the three aims listed above. The first aim of NPSE requires that: *"significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development."*

7.2.10 The second aim of the NPSE (mitigating and minimising adverse impacts on health and quality of life) refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate adverse effects on health and quality of life whilst also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur, as there may be situations where there is a limit to the effect of mitigation to try and minimise impacts, due to other essential operational requirements.

7.2.11 The third aim envisages pro-active management of noise to improve health and quality of life, again considering the guiding principles of sustainable development.

Planning Practice Guidance (PPG) June 2021

7.2.12 In October 2014, the Ministry of Housing, Communities & Local Government updated the Planning Practice Guidance (PPG) on noise, which provides guidance on the planning process. The main section of PPG was updated in July 2019 and consultation and pre-decision matters updated in June 2021.

7.2.13 The main planning section of PPG includes a table summarising the noise exposure hierarchy, based on the likely average response to noise. Under the heading of 'perception' the 'noticeable and not intrusive' assessment of noise is defined as "*noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such there is a perceived change in the quality of life."* The effect level under these conditions is deemed to be '*no observed adverse effect*' and no specific measures are required.

7.2.14 The PPG includes a table summarising the noise exposure hierarchy, based on the likely average response. Table 7.1 below provides the perception, example of outcome, effect and action required relative to noise:

Table 7.2 – Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect (NOEL)	No specific measures required
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect (NOAEL)	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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 and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/ awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent

Industrial & Environmental Noise Standards and Guidance

BS4142: 2014+A1:2019 `Methods for Rating and Assessing Industrial and Commercial Sound'

7.2.15 BS4142: 2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound' is based on the measurement of background sound using LA90 noise measurements, compared to source noise levels measured in LAeq units.

Once any corrections have been applied for source noise tonality, distinct impulses etc., the difference between these two measurements (i.e. known as the 'rating' level) determines the impact magnitude.

i) Typically, the greater the difference between the site `rating' level (i.e. the noise source contribution with any noise character penalties) and the representative background sound level, the greater the magnitude of the impact.
ii) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact (although this can be dependent on the context).
iii) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
iv) The lower the rating level is, relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact (although this can be dependent on the context).

7.2.16 In order to establish the rating level, corrections for the noise character need to be taken into consideration. The Standard states that when considering the perceptibility:

"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."

7.2.17 The subjective method adopted includes the following character corrections:

Table 7.2: BS4142: 2014 Character Corrections

Level of perceptibility	Correction for tonal character dB	Correction for impulsivity dB	Correction for intermittency dB	Correction for other character dB
Not perceptible	0	0	0	0
Just perceptible	+2	+3	0	0
Clearly perceptible	+4	+6	+3*	+3*
Highly perceptible	+6	+9	+3*	+3*

*Standard defines this should be readily distinctive against the residual acoustic environment, it is interpreted therefore to be either clearly or highly perceptible as a character.

BS8233: 2014 Guidance on Sound Insulation and Noise Reduction for Building

7.2.18 The British Standard BS8233 provides additional guidance on noise levels within buildings. These are based on the WHO recommendations and the criteria given in BS8233 for unoccupied spaces within residential properties.

7.2.19 The guidance provided in section 7.7 of BS8233 provides recommended internal ambient noise levels for resting, dining and sleeping within residential dwellings. Table 7.3 provides detail of the levels given in BS8233.

Table 7.3: BS8233: 2014 Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting Dining Sleeping (daytime resting)	Living Room Dining Room/area Bedroom	35dB LAeq 40dB LAeq 35dB LAeq	30dB LAeq
Study and work requiring concentration	Staff/Meeting Room Training Room/ Executive Office	35-45dB LAeq 35-45dB LAeq	

7.2.20 BS8233 is appropriate to apply to existing or proposed residential development and offices. The Site noise contribution should be within the proposed internal noise levels, which include the following noise limits:

i) Living room areas: <=35dB $L_{Aeq,16hours}$ (0700-2300 hours) [equivalent to an external level of approximately 65dB $L_{Aeq,16hours}$ based on typical standard double-glazed units in the closed position and approximately 50dB $L_{Aeq,16hours}$ in the open position].

ii) Bedrooms: <=30dB $L_{Aeq,8\ hours}$ (2300-0700 hours) [equivalent to an external level of approximately 60dB $L_{Aeq,8hours}$ based on typical standard double-glazed units in the closed position and approximately 45dB $L_{Aeq,8hours}$ in the open position].

iii) Offices: 35dB to 45dB $L_{Aeq,\ 8hours}$ [equivalent to an external level of approximately 65dB to 75dB $L_{Aeq,\ 8hours}$ based on typical standard double-glazed units in the closed position].

7.2.21 The above internal bedroom limits comply with sleep disturbance criteria defined by World Health Organisation guidelines (WHO). The WHO night noise guidelines for Europe refers to sleep disturbance limit of 42dB-45dB L_{Amax} for regular peak events within bedrooms [which is approximately 57dB-60dB L_{Amax} external to the bedroom window in the open position].

7.2.22 BS8233:2014 also advises that external noise in amenity space should aim to work within a range of 50-55dB $L_{Aeq,T}$ [13]. This would be applicable to recreational receptors, where practicable.

World Health Organisation (WHO) Guidelines for Community Noise: April 1999

7.2.23 This document provides further updated information on noise and its effects on the community. Within the document for noise '*In Dwellings*' it states that *"To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35dB L_{Aeq}. To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB L_{Aeq} on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB L_{Aeq}. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development."*

World Health Organisation (2009) – Night noise guidelines for Europe

7.2.24 The WHO regional office for Europe set up a working group of experts to provide scientific advice to the Member States for the development of future legislation and policy action in the area of assessment and control of night noise exposure. Considering the scientific evidence on the thresholds of night noise exposure indicated by $L_{night,outside}$ as defined in the Environmental Noise Directive (2002/49/EC), an $L_{night,outside}$ of 40dB should be the target of the night noise guidance (NNG) to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly. $L_{night,outside}$ value of 55dB is recommended as an interim target for the countries where the NNG cannot be achieved in the short term for various reasons, and where policy-makers choose to adopt a stepwise approach.

EA – Guidance: Noise and Vibration Management: Environmental Permits (January 2022)

[13] *paragraph 7.7.3.2*

7.2.25 As stated within the above guidance: *"Environmental permits have conditions that require operators to control pollution – this includes controlling noise and vibration."*

7.2.26 This guidance covers:

i) *"how the environment agencies will assess noise from certain industrial processes;*
ii) *what the law says you must do to manage noise and vibration; and*
iii) *advice on how to manage noise – in particular, how to carry out a noise impact assessment and what operators should include in a noise management plan."*

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

iv) At the permit application stage;
v) When applying to vary a permit; and
vi) To comply with specific permit conditions.

7.2.28 The guidance advises on four steps that are required when carrying out a noise impact assessment, these include:

a) Desktop risk assessment – identification of any audible noise plant or operations, identification of NSR, description and ranking of noise sources in terms of potential off-site impact, description of land between site and NSR.
b) Off-site monitoring survey – for new development this would relate to a study of the existing baseline sound conditions.
c) Source assessment – noise modelling of plant or operations, and if industrial source, using BS4142 and ISO9613 for prediction.
d) Best Available Techniques (BAT) or appropriate measures justification – measures to be adopted to avoid unacceptable noise pollution and demonstrate that BAT or appropriate measures would be introduced to prevent, or where that is not practicable, minimise noise impact.

Guidance on Construction Noise

BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites'

7.2.29 BS5228 refers to: *"the need for the protection against noise and vibration of persons living and working in the vicinity of, and those working on, construction and open sites. It recommends procedures for noise and vibration control in respect of construction operations and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners."*

7.2.30 Part 1 deals with noise in terms of background legislation and gives recommendations for basic methods of noise control relating to construction and open sites where significant noise levels may be generated. The guidance is aimed at giving advice on achieving 'best practice' in controlling noise and vibration from construction and open sites. There is an example of noise limits given in Annex E, which sets out cut-off limits between 65dB(A) and 75dB(A), or 5dB(A) above the ambient noise, whichever is the greater. Part 2 of BS 5228 deals specifically with vibration control and provides the legislative background to the control of vibration and recommendations for controlling vibration at source and management controls (e.g. liaison with communities, supervision, preparation and choice of plant etc.).

Consultation

7.2.31 An EIA Screening Opinion in respect to the Proposed Development was provided by Lancashire County Council (LCC) dated 26 March 2024 which considered that potential effects would trigger the requirement for an EIA. Pre-application engagement with LCC was also undertaken via a pre-application advice request, to which LCC provided a written response on 22 March 2024. The pre-application advice response provided advice on information to be submitted in relation to the establishment of background sound levels at nearest residential receptors relative to the Site operating hours, advising appropriate guidance and standards for noise to assess impacts, assessing noise produced from plant and equipment and processing activities, and details of mitigation measures to reduce noise levels to an appropriate noise level in accordance with BS4142, taking into account any tonal or impulsive noise characteristics.

Scope of Assessment

Assessment of Significance / Assessment Criteria

7.2.32 The level of an effect is a function of the sensitivity or importance of the receiver, or receptor, and the scale or magnitude of the impact. In the case of this assessment the level of the effect has been determined by reference to existing guidance and standards that are explained below.

7.2.33 The following types of receptors have been identified:

a) Residents of existing houses adjacent to the Site who could experience site operational noise during daytime and night-time periods.
b) Residents of existing houses who could experience road traffic noise during daytime and early morning periods.
c) Residents of existing houses who could experience construction, noise during daytime at the Proposed Development.
d) Ecologically sensitive sites which could experience noise during construction during the daytime and operational noise during daytime and night-time.
e) Users of rights of way along Wyre Way along the eastern boundary of the Hillhouse Business Park and Site would experience noise as a transient event.

Construction and De-commissioning Noise

7.2.34 For residents of houses that could be exposed to construction and de-commissioning noise, BS5228:2009+A1:2014 is considered to be the appropriate standard. This standard does not prescribe limits but requires 'best practicable means' (BPM) to be employed to control noise generation. The criterion therefore is that BPM should be employed, and conditions implemented, for example to restrict construction and demolition noise to non-sensitive hours.

7.2.35 The construction and de-commissioning impact semantic scale, set out in Table 6.4 below, is based on the ABC method of assessment described in Annex E.3.2 of BS5228, which sets out threshold values depending upon the ambient noise at receptors, which have been defined from the baseline sound survey.

7.2.36 According to the guidance found within the Design Manual for Roads and Bridges (DMRB LA 111), the LOAEL and SOAEL for noise sensitive receptors within the construction activity study area, with reference to baseline noise levels are established in accordance with Table 7.4.

Table 7.4: Impact Magnitude Category – Construction & De-commissioning Noise

Time Period	LOAEL	SOAEL	Threshold Level $LAeq_{1hr}$ dB
Day (0700-1900 Weekday and 0700-1200 Saturdays)	Baseline noise levels $L_{Aeq,T}$	Threshold level determined as per BS5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	65-75
Night (2300-0700)	Baseline noise levels $L_{Aeq,T}$	Threshold level determined as per BS5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	45-55
Evening and weekends (time periods not covered above)	Baseline noise levels $L_{Aeq,T}$	Threshold level determined as per BS5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	55-65

7.2.37 The magnitude of impact for construction and de-commissioning noise, shall be determined in accordance with Table 7.6 (as defined in DMRB LA 111).

Construction Phase – Vibration

7.2.38 For construction phase vibration, the LOAEL and SOAEL for construction vibration is set out in DMRB LA 111[8] and is provided in Table 7.5 below (Appendix 7.7 provides an explanation of technical terms associated with vibration assessment).

Table 7.5: Construction Vibration LOAEL's and SOAEL's for All Receptors

Time Period	LOAEL	SOAEL
All time periods	0.3mm/sec PPV	1.0mm PPV

7.2.39 The magnitude of impact for construction and decommissioning noise and vibration, shall be determined in accordance with Table 7.6 (as defined in DMRB LA 111[8]).

Table 7.6: Impact Magnitude Category – Construction & De-commissioning Noise

Magnitude of Impact	Construction & De-commissioning Noise Level	Construction & De-commissioning Vibration Level
Negligible	Below LOAEL	Below LOAEL
Minor (Slight)	Above or equal to LOAEL and below SOAEL	Above or equal to LOAEL and below SOAEL
Moderate	Above or equal to SOAEL and below SOAEL +5dB	Above or equal to SOAEL and below 10mm/sec PPV
Major	Above or equal to SOAEL +5dB	Above or equal to 10mm/sec PPV

Construction & De-commissioning Phase Road Traffic Impacts

7.2.40 According the DMRB LA 111 guidelines, the magnitude of impact at noise sensitive receptors of construction and de-commissioning traffic shall be determined in accordance with Table 7.7.

Table 7.7: Magnitude of Impact at Receptors

Magnitude of Impact	Increase in Basic Noise Level of Closest Public Road Used for Construction & De-commissioning Traffic (dB)
Negligible	Less than 1.0
Minor (Slight)	Greater than or equal to 1.0 and less than 3.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Major	Greater than or equal to 5.0

Note: Construction noise and construction traffic noise shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

1) *10 or more days or nights in any 15 consecutive days or nights.*
2) *a total number of days exceeding 40 in any 6 consecutive months.*

Operational Noise

7.2.41 Table 7.8 below shows the proposed impact magnitude methodology considering the guidance contained within BS4142: 2014+A1:2019[5] for fixed and mobile plant noise.

Table 7.8: Impact Magnitude Scale – Site Operations

Rating* level above background noise dB(A) as BS4142:2014+A1:2019	Description of Effect	Impact Magnitude	PPG Effect Level
-10 to 0	No discernible effect on the receptor	Negligible	NOEL to NOAEL
+0.1 to +4.4	Non-intrusive – Noise impact can be heard but does not cause any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Slight	LOAEL
+4.5 to +9.4	Intrusive - Noise impact can be heard and causes small changes in behaviour and/or attitude. Affects the character of the area such that there is a perceived change in the quality of life. Potential for non-awakening sleep disturbance.	Moderate	LOAEL to SOAEL
+9.5 or greater	Disruptive – Causes a material change in behaviour and/or attitude e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty getting to sleep. Quality of life diminished due to change in character of the area.	Substantial	SOAEL
Undefined**	Physically Harmful – Significant changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or physiological effects e.g. regular sleep	Severe	UOAEL

Rating* level above background noise dB(A) as BS4142:2014+A1:2019	Description of Effect	Impact Magnitude	PPG Effect Level
	deprivation/awakening; loss of appetite, significant, medically definable harm		

*Note: The 'rating' level is the difference between the noise contribution from site and the existing background sound level allowing for any adjustments required for noise characteristics (i.e. tonal, impulsive or intermittent noise character). The Standard advises that rounding of numbers to one decimal place should relate to levels of 0.5dB or above, which is reflected in the table limits. *The intrusiveness depends on the context of the residual environment and therefore may fall into SOAEL if background and residual levels are similar. **Difficult to define physical harmful effect as this depends on numerous site-specific factors which may include type and character of noise source, location, human sensitivities, duration and receptor expectations etc.*

7.2.42 The Institute of Environmental Management and Assessment (IEMA)[14] has provided 'Guidelines for Environmental Noise Impact Assessment'. The guidelines set out an example of how changes in noise level may be assessed in terms of residual L_{Aeq}. This assists in determining the impact of Site operational noise relative to the context of the existing noise climate, which is detailed in Table 7.9.

Table 7.9: Impact Magnitude Scale – General Site Noise

Change in noise levels LAeq dB	Description of Effect	Impact Magnitude	PPG Effect Level
< +2.9	No discernible effect on the receptor	Negligible	NOEL
+3.0 to +4.9 (high receptor sensitivity)	Non-intrusive - Noise impact can be heard but does not cause any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Slight	NOAEL
+5.0 to +9.9 (high receptor sensitivity)	Intrusive - Noise impact can be heard and causes small changes in behaviour and/or attitude. Affects the character of the area such that there is a perceived change in the quality of life. Potential for non-awakening sleep disturbance.	Moderate	LOAEL
10 or greater (high receptor sensitivity)	Disruptive – Causes a material change in behaviour and/or attitude e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty getting to sleep. Quality of life diminished due to change in character of the area.	Substantial	SOAEL
Undefined*	Physically Harmful – Significant changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or physiological effects e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm.	Severe	UOAEL

[14] *Institute of Environmental Management and Assessment (IEMA) `Guidelines for Environmental Noise Impact Assessment: October 2014.*

Operational Road Traffic Noise

7.2.43 To assess the likely impact on NSR from noise due to any increased traffic on the local road network associated with the Proposal, noise calculations have been undertaken using CRTN calculation methodology and traffic flow information for the Proposal.

7.2.44 The DMRB LA 111 provides guidance on the magnitude of change in terms of road traffic noise. The procedure for assessing noise impacts advises the use of a LA_{10} measurement index based on a daytime 18-hour time period (i.e. 0600 to 2400 hours) and night-time period (i.e. 0000-0600 hours). Further assessment of the impact would be required where changes of 1dB(A) or more are expected in the short-term and changes of 3dB(A) in the long term.

7.2.45 DMRB LA 111 defines the short term and long-term scenarios which are considered to represent the situation when a new road opens (short term) and 15 years after a road opens (long term). The magnitude of change criteria is set out in Table 7.10 for the short term and 7.11 for the long term.

Table 7.10: Magnitude of Change – Road Traffic Noise – Short-Term

Short Term Magnitude	Short Term Noise Change (dB $L_{A10,18hr}$ or L_{night})
Negligible	Less than 1.0
Minor (Slight*)	1.0 to 2.9
Moderate	3.0 to 4.9
Major (Substantial/Severe)	Greater than or equal to 5.0

*This has been amended by the author of this assessment to reflect the impact matrix

Table 7.11: Magnitude of Change – Road Traffic Noise – Long-Term

Long Term Magnitude	Long Term Noise Change (dB $L_{A10,18hr}$ or L_{night})
Negligible	Less than 3.0
Minor (Slight)	3.0 to 4.9
Moderate	5.0 to 9.9
Major (Substantial/Severe)	Greater than or equal to 10.0

Receptor Sensitivity and Overall Level of Effect

7.2.46 In order to determine the level of the effect, not only must the magnitude of this impact be determined but also the sensitivity of the receptors to the impact. For this assessment, the categories presented in Table 7.12 have been adopted.

Table 7.12: Receptor Sensitivity

Receptor Sensitivity	Type of Receptor
High	Dwellings / residential properties including houses, flats, old people's homes, hospitals, schools, churches, caravans and open spaces / conservation areas.
Moderate	Commercial premises including retails and offices etc.
Low	Industrial premises including warehouses and distribution etc.

7.2.47 Based upon the assessment of impact magnitude and the sensitivity of individual receptors, the matrix shown in Table 7.13 has been developed in order to provide an indication of the possible level of effect for each predicted noise impact. Given that there are many factors which may affect the level of the effect of an impact, not least, the character of the noise and timescales over which the noise operates, the overall level of effect must be assessed on an individual basis using professional judgement and experience. Therefore, whilst the matrix provides a useful indication of the likely significance it cannot be applied in all situations.

Table 7.13: Level of Effect Matrix

Impact Magnitude	Receptor Sensitivity		
	High	Moderate	Low
Severe	Major	Major/Moderate	Moderate/Minor
Substantial	Major/Moderate	Moderate	Minor
Moderate	Moderate	Moderate/Minor	Minor/Neutral
Slight	Minor	Minor/Neutral	Neutral
No significant impact (negligible)	Neutral	Neutral	Neutral

7.2.48 Where a level of effect is defined as Major or Major/Moderate then the effect is likely to be considered significant, i.e. an impact that is likely to be a key material factor in the decision-making process. Effects between neutral and moderate are not deemed to be significant.

Limitations

7.2.49 No specific limitations were encountered in the preparation of this assessment chapter.

7.3 Baseline

7.3.1 The Site is located within Hillhouse Enterprise Zone, circa 1.5km east of the A585. The A585 connects Thornton with the M55 motorway which runs west to east from Blackpool to Preston, where it ultimately meets the M6 motorway.

7.3.2 The local sound environment is generally formed by a mixture of noise from road traffic and industrial activities, which have been present at the Enterprise Zone for a number of years.

7.3.3 The monitoring positions are shown on Figure 7.1. The noise monitoring positions are representative of nearest existing and proposed residential receptors adjacent to the Proposed Development and provide broadband data of the existing sound climate at these receptors. Details of the instrumentation used for the survey are detailed in Appendix 7.2.

7.3.4 The existing baseline sound survey was undertaken over a 4-day period including a weekend from Friday 19th through to Monday 22nd April 2024 at three fixed locations and is considered to provide representative baseline sound levels.

7.3.5 The existing background sound survey was carried out in accordance with the advice given in BS4142: 2014+A1:2019.

7.3.6 The monitoring positions were as follows:

Position A (Receptor R1: Rear of Roscoe Avenue) – Southwest of Site (grid reference: 334664 443015)

7.3.7 This monitoring position is representative of the closest existing receptor south-west of the Proposed Development and is located just north and adjacent to Roscoe Avenue. Noise levels at this location are dominated by local road traffic noise and industrial noise from the Business Park. The noise meter was positioned to the rear of the nearest dwelling and representative of dwellings local to the Business Park. Figure 7.1 shows the location.

Position B (Receptor R2: Rear of Caravan Site) – South of Site (grid reference: 335020 443212)

7.3.8 Position B was chosen as a suitable monitoring position to represent typical baseline levels in the vicinity of the caravan park properties south of the Proposed Development. Noise levels at this location are generally formed by noise from the Business Park, distant road traffic noise and birdsong. Figure 7.1 shows the location.

Position C (Receptor R3: Wyre Way) – East of Site (grid reference: 335300 443302)

7.3.9 This monitoring position is representative of typical baseline levels in proximity to the southeastern corner of the Business Park and was located adjacent to the River Wyre saltmarsh and mudflats. Noise levels at this location are generally formed by the Business Park activities and birdsong. Figure 7.1 shows the location.

7.3.10 The above monitoring positions represent the nearest receptors to the Proposed Development and as noise levels reduce relative to increasing distance (under normal environmental and assessment conditions) then impacts at other more distant NSR will experience a similar or lower impact.

7.3.11 Although ambient noise levels can vary depending on weather conditions, the purpose of the baseline survey was to monitor sound levels under suitable weather conditions. This then provides a typical and representative indication of ambient conditions. The effect of wind on noise levels can be significant, as an example, BS8233: 2014 (Ref. Paragraph 6.8) states: *"Whether noise levels are measured or predicted, wind gradients, temperature gradients and turbulence affect the level of received sound and audibility over short periods. The magnitude of these effects, i.e. variations in noise level and audibility, increases with increasing distance between source and receptor. The effects are asymmetrical and, for distances of 500m to 1000 m, typically range from increasing the level by typically 2 dB downwind to reducing it by typically 10 dB upwind. It is not usually practicable to use these factors in design, but the prevailing wind direction should be considered when planning building orientation. Noise from wind and precipitation, including the wind-generated noise from trees, can also affect noise measurements."*

7.3.12 For the purpose of this assessment, it is assumed that monitoring and assessment of operational noise from the Proposed Development is undertaken under appropriate weather conditions and therefore any significant positive or negative vector from wind direction is not representative. The effect of wind speed and direction can also increase background noise levels thereby masking any potential increase in site-specific noise levels. For this reason, it is assumed that typical weather conditions apply and no increase or decrease for the wind vector is required. Any monitoring periods where rainfall occurred, or wind speeds were above 5m/s or temperature below 0^{o}C were removed from the data set for analysis.

7.3.13 In consideration that the baseline survey included weekend monitoring, which is the quietest period of the week (due to lower traffic flow volumes and reduced industrial activity which dominate the noise climate), it is considered to represent a robust assessment of existing background sound levels. This can then be referenced for the assessment of impacts for the Proposed Development for future operation.

Existing Scenario

7.3.14 The Site is located in a mixed industrial and residential area with the Hillhouse Enterprise Zone located immediately north of the nearest residential areas. The local sound environment is therefore generally formed by noise from Enterprise Zone activities, local traffic movement and birdsong.

7.3.15 The baseline sound monitoring positions are representative of the area and NSR surrounding the Site (shown on Figure 7.1) adjacent to the Proposed Development and provide broadband data of the existing sound climate at these receptors.

7.3.16 The results of measurements taken at the fixed monitoring positions are presented in Tables 7.14 to 7.15 and detailed measurements are provided in Appendix 7.3.

Table 7.14: Existing Background Sound Levels at Monitoring Positions during Daytime

Monitoring Position (Refer to Figure 7.1)	Time Period (0700-2300)	LAeq dB	LA10 dB	LA90 dB	LAmax dB	Representative LA90 dB
Position A: Rear of Roscoe Av.	Daytime	52	54	45	44-82	**42**
Position B: Rear of Caravan Site	Daytime	51	52	46	45-93	**46**
Position C: Wyre Way	Daytime	52	54	46	41-89	**45**

Table 7.15: Existing Background Sound Levels at Monitoring Positions during Night-time

Monitoring Position (Refer to Figure 7.1)	Time Period (2300-0700)	LAeq dB	LA10 dB	LA90 dB	LAmax dB	Representative LA90 dB
Position A: Rear of Roscoe Av.	Night-time	49	51	42	37-82	**40**
Position B: Rear of Caravan Site	Night-time	51	52	45	49-78	**44**
Position C: Wyre Way	Night-time	52	54	47	41-80	**45**

7.3.17 The results of existing background sound measurements taken at the residential fixed monitoring positions indicate that representative background sound levels during the daytime period (0700-2300 hours) vary between 42dB and 46dB L_{A90} and during the night-time period (i.e. between 2300-0700 hours) between 40dB and 44dB L_{A90}.

Identification of Noise Sensitive Receptors (NSR)

Residential Receptors

7.3.18 The NSR to the south-west of the Proposed Development are located off Roscoe Avenue and Bentley Green (Receptor R1) are located at circa 300m to 400m from the Site boundary (Grid reference: 334668 443000 & 334866 442980).

7.3.19 Based on distance relative to the Proposed Development, the NSR properties are located south-east of the Site, at the caravan park development off River Road (Receptor R2) at circa 50m to 120m from the Site boundary (Grid reference: 335085 443214 & 335222 443224).

Ecological Sensitive Receptors

7.3.20 The nearest ecological receptors to the Proposed Development are to the east of the Site along the River Wyre and the use of the saltmarsh and mudflats for bird species designated for passage and wintering birds, referred to as Receptor E1 at circa 55m to 260m distance from the Site boundary (Grid reference: 335057 443523, 335112 443492, 335213 443402, 335331 443409 & 335340 443484).

Recreational Receptors

7.3.21 The nearest recreational receptors to the Proposed Development are to the east of the Site where the public walk along Wyre Way (i.e. PROW), referred to as Receptor

R3 at circa 20m at its closest approach to Site boundary (Grid reference: 334928 443574, 335029 443501, 335122 443441 & 335191 443371).

7.3.22 There are no known future receptors proposed that would be of greater sensitivity than those considered in this assessment. Furthermore, there are no known additional developments proposed in the area that are considered likely to result in any material cumulative effects in combination with the Proposed Development.

7.4 Assessment of Effects

Embedded Mitigation

7.4.1 The predicted noise levels from the Proposed Development have been calculated using the noise levels provided within Appendix 7.4. The noise levels are based on library data from similar plant used on other UK sites and include the following mitigation measures (other than that expected from a typical IBA installation):

(i) Processing plant enclosed within a building fitted with single skin cladded walls and roof.
(ii) Processing plant access door closed except for access to vehicles for offloading and collection unless for maintenance or emergency. Doors into Processing Building formed by an electric roller shutter door.
(iii) IBA Storage contained within a building fitted with single skin cladding to walls and roof areas and lower walls formed by concrete (3m height), with the north-eastern facade open to provide sufficient access for site traffic and mobile plant.
(iv) Metal storage contained within a building with partial open front façade formed by single skin cladding and concrete walls to lower section of walls (3m height).
(v) Buildings constructed from single skin cladding (Rw=24dB) and lower concrete walls where material storage and bulking required.
(vi) Design to ensure no noise character is perceptible at NSR in accordance with BS4142: 2014+A1:2019.
(vii) Sound power levels of other plant as detailed in Appendix 7.4.
(viii) Mobile plant and site-controlled vehicles fitted with non-tonal reversing alarms (i.e. broadband noise, `white noise’ or SMART type reversing alarms).

7.4.2 Predicted noise levels from the Proposed Development have been calculated using empirical measured plant noise levels recorded at similar IBA sites operational in the UK as detailed in Appendix 7.4.

Construction Phase Noise Effects – Plant Noise

7.4.3 Construction works would involve the movement of soils, piling and the construction of new buildings and infrastructure. Excavators, haulage lorries, piling rigs, cranes, dumpers, concrete plant, diggers and paving machines would all, at some time during the construction programme, be operating at the Site. In addition, ancillary equipment such as small generators, pumps and compressors may also be operating on occasions.

7.4.4 The above noise sources and their associated activities would vary from day to day and may be in use at different stages of the construction period for relatively short durations. The noisiest activities are expected to be generated during soil movement and piling work during the initial stages of construction when excavators, piling rigs, dozers or similar may be in use.

7.4.5 The actual noise level produced by construction work would vary at the nearest property boundary at any time depending upon a number of factors including the plant location, duration of operation, hours of operation, intervening topography and type of plant being used. Refer to Appendix 7.6 for construction plant inventory that has been taken into account in the assessment.

7.4.6 The construction works would take place during normal daytime operating hours. The daytime activities and associated noise levels are provided below in Table 7.16, which is based on the ABC method of assessment within BS5228: 2009[7] (Annex E.3.2.).

Table 7.16: Noise Predictions for Highest Likely Construction Noise for Proposed Development at NSR (daytime activities)

Receptor	Approximate Distance to receptor (m)	Activity	Existing Baseline Levels L_{Aeq} dB	Predicted Noise Level, L_{Aeq1hr} dB	BS5228 Threshold Value L_{Aeq1hr} dB	Increase above threshold $L_{Aeq,1hr}$ dB
Residential Receptors						
R1: Roscoe Avenue & Bentley Green (south- west of Site). Grid reference: 334668 443000 & 334866 442980	300-540 320-540 320-540 300-540 320-540	Site Preparation Piling[1] General activities Infrastructure Building Constr'n	52 52 52 52 52	46-51 47-52 42-47 43-51 46-51	65 65 65 65 65	0 0 0 0 0
R2: Caravan Park (southeast and east of Site). Grid reference: 335085 443214 & 335222 443224	130-370 130-370 130-370 130-370 130-370	Site Preparation Piling[1] General activities Infrastructure Building Constr'n	51 51 51 51 51	49-60 50-61 46-56 46-60 49-60	65 65 65 65 65	0 0 0 0 0
Receptor	**Approximate Distance to receptor (m)**	**Activity**	**Existing Baseline Levels L_{Aeq} dB**	**Predicted Noise Level, L_{Aeq1hr} dB**	**TIDE[15] Threshold Value L_{Aeq1hr} dB**	**Increase above threshold $L_{Aeq,1hr}$ dB**
Ecological Receptors						
E1: River Wyre (east of Site). Grid reference: 335057 443523 335112 443492 335213 443402	55-260 65-200 65-200 55-260 65-200	Site Preparation Piling[1] General activities Infrastructure Building Constr'n	52 52 52 52 52	47-64 52-64 47-59 50-65 55-68	55-65 55-65 55-65 55-65 55-65	0 0 0 0 +3

[1]Piling noise levels based on percussive piling (BS5228:2009+A1:2014 Table C3.8)

7.4.7 On the basis of the above predictions the increase above the thresholds, as a result of construction at residential NSR, is likely to result in an impact magnitude classification of ***negligible to slight*** resulting in a ***neutral to minor*** level of effect (according to Tables 7.4 and 7.6) at all residential receptors and therefore ***not significant***.

7.4.8 At the ecological NSR areas, during temporary peak periods of construction activity when the plant is at closest approach to the receptor, according to the TIDE `Waterbird Disturbance and Mitigation Toolkit’[15] methodology the impact without mitigation measures according to Table 7.6 would be ***slight to moderate*** and the level of effect ***minor to moderate*** and ***not significant*****.** Noise mitigation measures

[15] *INTERREG IVB-Project “Tidal River Development’ TIDE `Waterbird Disturbance and Mitigation Toolkit’: 2024.*

would be adopted to control noise along the eastern boundary as detailed in section 7.6.

7.4.9 The application of applying `best practical means' (BPM) in accordance with BS5228-1:2009+A1:2014[7] will assist in reducing and minimising impact from construction noise. Refer to section 7.6 for proposed mitigation.

7.4.10 The decommissioning phase of the Proposed Development would produce noise levels very similar to the construction phase with comparable noise impacts and effects at NSR. Typical noise levels from decommissioning plant are provided in Appendix 7.6. Best practicable means would be applied to minimise noise similar to that proposed for the construction phase.

Construction LAmax Levels

7.4.11 Consultation with Natural England on other industrial developments on the Hillhouse Business Park has been undertaken and in terms of impacts during the construction phase, the assessment of L_{Aeq} and L_{Amax} levels is required.

7.4.12 Peak L_{Amax} activities have been calculated and noise contour maps provided in Appendix 7.6) to show the predicted noise levels based on empirical data from percussive piling relative to the residential and ecological receptors.

Table 7.17: Noise Predictions (in terms of LAmax) for Highest Likely Construction Noise for Proposed Development at NSR (daytime activities)

Receptor	Approximate Distance to receptor (m)	Activity	Existing Baseline Levels L_{Amax} dB	Predicted Noise Level, L_{Amax} dB
R1: Roscoe Avenue & Bentley Green (south- west of Site).	300-540 320-540 320-540 300-540 320-540	Site Preparation Piling[1] General activities Infrastructure Building Constr'n	58-81 58-81 58-81 58-81 58-81	49-51 49-57 45-48 45-49 48-59
R2: Caravan Park (southeast and east of Site).	130-370 130-370 130-370 130-370 130-370	Site Preparation Piling[1] General activities Infrastructure Building Constr'n	56-77 56-77 56-77 56-77 56-77	52-62 52-68 48-59 49-59 51-65
E1: River Wyre saltmarsh and mudflats area (east of Site).	55-260 65-200 65-200 55-260 65-200	Site Preparation Piling[1] General activities Infrastructure Building Constr'n	60-85 60-85 60-85 60-85 60-85	50-67 54-69 49-64 52-68 57-71

[1]Piling noise levels based on percussive piling (BS5228:2009+A1:2014 Table C3.8)

7.4.13 Table 7.17 shows the peak predicted L_{Amax} activities based on empirical data from percussive piling and other construction related works, relative to the residential and ecological receptors.

7.4.14 The results show that without mitigation the highest predicted L_{Amax} levels adjacent to the saltmarsh and mudflats of the River Wyre (without any local screening) are likely to range between 49dB to 71dB L_{Amax} during general and peak construction activities. Existing ambient L_{Amax} levels adjacent to the River Wyre saltmarsh and mudflats during daytime construction hours (0700 to 1900 hours) is typically between 60dB to 85dB L_{Amax}.

Mitigation of L_{Amax} Construction Levels at Ecological NSR

7.4.15 The above results indicate that the highest likely L_{Amax} levels are shown to be within the range of measured baseline L_{Amax} levels and therefore we do not expect this to be significant in terms of disturbance. If percussive piling is required, measures to reduce noise levels would be considered including local portable acoustic screening around the piling area or using `soft-start' works to avoid sudden noise by gradually increasing start-up noise levels to allow birdlife to habituate to the temporary noise. Further protection of bird passage and wintering would involve avoiding peak impulse noise events (e.g. piling, infrastructure and building steelwork construction) during the sensitive period between September and March.

Recreational Receptors

7.4.16 The PROW along the Wyre Way follows the eastern boundary of Hillhouse Enterprise Zone and as such the public using this footpath would only be experiencing noise from the Proposed Development during construction and operational periods for a short period and would therefore be a temporary transient event. The application of BS5228 noise threshold for construction or decommissioning is not appropriate as it refers to residential receptors. Noise levels during construction without mitigation is predicted to range between 53dB and 75dB $L_{Aeq,1hr}$. Noise mitigation measures would however, be adopted to control noise along the eastern boundary as detailed in section 7.6 by the application of `best practicable means'.

Construction Phase Noise Effects – Road Traffic Noise

7.4.17 Chapter 4.0 and Chapter 5.0 of the ES outline the potential construction phase activities and the level of staff and HGV traffic that could arise during the temporary construction period.

7.4.18 The number of vehicle movements associated with the temporary construction phase of the Proposed Development will be lower than that assessed for the operational phase and therefore according to the DMRB LA 111[8] methodology, the impact will not be any higher than a ***slight*** impact magnitude and a ***minor*** effect based on the weekday and Saturday construction periods. The results of analysis show that impacts would be ***not significant*** at NSR.

Construction Phase Vibration Effects

Typical Vibration Levels

7.4.19 The highest levels of vibration generated by construction plant is likely to include the following:

- Piling rigs;
- Vibratory rollers and compactors;
- Material offloading onto hard surfaces; and
- Concrete vibratory plant.

7.4.20 The type of piling required will depend on the ground conditions at the Site. This could involve either percussive or non-percussive techniques. At the closest distance to sensitive receptors (i.e. ecological) at circa 65m, typical field measurements taken at sites in the UK where continuous flight auger ("CFA") piling or vibratory rollers have been used would indicate that at a distance of around 65m the peak particle velocity is around 0.1mm/s (refer to Appendix 7.8). For percussive vibration, the range of vibration would be between 0.3 to 1.2mm/sec.

BS5228:2009+A1:2014 Part 2: Vibration[7]

7.4.21 Part 2 of the Standard deals with vibration from construction and open sites and provides information on the effects of the levels of vibration, human and structural response, response limits of structures and practical measures to reduce vibration.

7.4.22 The distance from nearest residential receptors to any likely use of piling rigs (i.e. building foundation construction) and vibratory compaction (i.e. during road construction) is likely to be a minimum distance of 130m to the residential NSR and 55m to 65m from the nearest ecological sensitive receptor.

Table 7.18: Highest Likely Construction Vibration at NSR (daytime activities) using CFA or Percussive Piling Techniques

Receptor	Type of Piling	Approximate Distance to receptor (m)	Receptor Sensitivity	Range of Highest Likely Vibration (mm/sec)
R1: Roscoe Avenue & Bentley Green (south- west of Site)	CFA Percussive	320 320	High High	0 0.1
R2: Caravan Park (southeast and east of Site)	CFA Percussive	130 130	High High	0.02 0.5
E1: River Wyre (north to northeast of Site)	CFA Percussive	65 65	High High	0.2 1.2

7.4.23 Based upon the above information, at the closest approach to existing residential NSR, the highest likely levels of ground borne vibration would be either below perceptible levels of vibration (i.e. 0.3mm/s) or just above perceptibility at residential NSR. The vibration levels at the ecological NSR based on CFA piling would also be below perceptible levels and with percussive piling above perceptibility but well below cosmetic damage limits. The results of empirical measurements of vibration from vibratory plant at distances greater than 30m according to BS6472:2008[14] would indicate that the vibration levels are unlikely to give rise to an ‘adverse comment’ from a nuisance aspect.

7.4.24 It should be noted that the type of equipment, ground conditions and structural form could all affect the resultant level of vibration. At this stage, it has been assumed that the highest likely vibration level scenario occurs (i.e. a conservative estimate of potential effects).

7.4.25 The levels of temporary vibration, as a result of construction, are likely to result in an impact magnitude classification of ***negligible*** and a level of effect of ***neutral*** during peak vibration at residential NSR. At ecological NSR, the impact would be a ***negligible to moderate*** impact magnitude and ***neutral to moderate*** effect and therefore ***not significant***. The application of `best practicable means’ (“BPM”) would be applied according to BS5228-2:2009+A1:2014[7].

Operational Phase

Noise Characteristics

7.4.26 In terms of the potential noise characteristics of the Proposed Development, the following provides the details of the appropriate noise criteria applied in the assessment in accordance with BS4142: 2014+A1:2019[5]:

Tonality

7.4.27 In terms of tonality, the associated plant and storage activities would be enclosed within purpose-built buildings. The route of the HGVs utilises a one-way system and the design prevents the need for vehicles to reverse into the Tipping Hall, thereby avoiding any effects from reversing alarms outside buildings. Mobile plant used on Site would be fitted with a non-tonal reversing alarm. Plant emitting any significant tonal character at source would be controlled by design or mitigation measures. It is therefore assumed that no tonal noise character penalty is required.

Impulsivity

7.4.28 In terms of impulsivity (e.g. noise from offloading and loading of IBA material) this would take place inside the building. Taking into account the design of the Proposed Development, mitigation measures, separation distance and residual sound levels relative to residential NSR, we conclude that an impulse noise character penalty is not required.

Intermittency

7.4.29 In terms of intermittency the only typical intermittent activity is likely to be noise from daytime HGV movements on-site. These are unlikely to be distinctive at NSR during daytime periods (due to the influence of residual ambient noise levels providing masking of this character).

7.4.30 In respect of the `embedded mitigation' scheme, there is likely to be perceptible impulse noise character at NSR and in order to comply with the latest Environment Agency (EA) Guidelines: `Noise and vibration management: environmental permits' (July 2021)[4]; for robustness a penalty of +3dB for noise character is allowed. With the proposed additional mitigation strategy this provides significant improvement in radiated noise levels and controls of those areas of plant and activity that would produce noise character and it is concluded that a noise character penalty is not required.

7.4.31 Tables 7.19 and 7.20 below show the highest noise prediction relating to fixed plant and vehicular noise sources on Site operating during the daytime, and fixed plant only operating during night-time periods. Calculations include the embedded noise control measures outlined at paragraph 7.4.1.

Daytime Operations

7.4.32 Table 7.19 below provides information on the predicted noise levels during daytime operations (i.e. in accordance with section 7.2 Note 1 of BS4142: 2014+A1:2019[5] 07.00 to 23.00 hours) at the Proposed Development

Table 7.19: Predicted Noise Levels from Proposed Development during Daytime Operations (with Embedded Noise Mitigation Measures and Daytime Vehicle Movement)

Receptor Position (Refer to Figure 7.1)	Time Period	Predicted Rating[1] Noise Level from Site L_{Aeq1hr} dB	Assessment[2] Baseline Sound Level LA90 dB [LAeq]	Rating[1] compared to Baseline Sound L_{Aeq1hr} dB	Noise Change[3] LAeq dB
Residential Receptors					
R1: Roscoe Avenue & Bentley Green (south- west of Site)	0700-2300	42[1]-44[1]	42 [52]	0 to +1	+0.2 to +0.3
R2: Caravan Park (southeast and east of Site)	0700-2300	45[1]-50[1]	46 [51]	-1 to +4	+1.0 to +1.5

Note 1: Noise characteristics at receptor locations without mitigation has a potential impulse noise penalty of+3dB which is included in the assessment for robustness.
Note 2: Based on a 4-day period of baseline sound monitoring including a weekend at NSR.
Note 3: Column 6 is calculated by the logarithmic addition of columns 3 (minus 3dB) and column 4 **Leq** level in [ ] and subtraction of the background **Leq** noise level (i.e. column 4 in [ ]).

7.4.33 The fifth column in Table 7.19 shows the difference between the predicted rating noise level and the baseline sound level at the receptor positions. The rating level in column five is therefore in accordance with the methodology found within BS 4142: 2014+A1:2019[5], which is the most relevant applicable noise assessment guidance.

7.4.34 According to BS4142: 2014+A1:2019[5], the rating level relative to the assessment baseline noise would indicate ***negligible*** to ***moderate*** impact magnitude at residential NSR (refer to Table 7.8), where the impact significance would be ***moderate*** level of effect. The effects without additional mitigation and therefore ***not significant***. According to BS4142:2014+A1:2019 this would result in an **adverse** impact. Additional mitigation measures are provided in section 7.6 to deal with reducing the impact below an adverse impact.

7.4.35 In relation to the IEMA guidelines[16] (which considers the increase in existing residual noise and therefore the context of the impact, refer to Table 7.9), it can be seen that the magnitude of the impact during daytime periods (final column of table) shows that there is a change of up to +0.2 to +1.5dB in noise level, which indicates a ***negligible*** impact. The predicted level of effect that would be experienced by residential receptors would therefore be a ***neutral*** level of effect in relation to this guidance.

Night-time Operations

7.4.36 Table 7.20 below provides information on the predicted noise levels during the night-time (i.e. 23.00 to 07.00 hours according to BS4142: 2014+A1:2019[5] section 7.2 Note 1).

Table 7.20: Predicted Noise Levels from Proposed Development during Night-time Operations (with Embedded Noise Mitigation Measures)

Receptor Position (Refer to Figure 7.1)	Time Period	Predicted Rating[1] Noise Level from Site $L_{Aeq15mins}$ dB	Assessment[2] Baseline Sound Level LA90 dB [LAeq]	Rating[1] compared to Baseline Sound $L_{Aeq15mins}$ dB	Noise Change[3] LAeq dB
Residential Receptors					
R1: Roscoe Avenue & Bentley Green (south- west of Site)	2300-0700	40[1]-41[1]	40 [48]	+2 to +3	+0.3 to +0.4
R2: Caravan Park (southeast and east of Site)	2300-0700	42[1]-46[1]	42 [51]	0 to +4	+0.3 to +0.6

Note 1: Noise characteristics at receptor locations without mitigation has a potential impulse noise penalty of+3dB which is included in the assessment for robustness.
Note 2: Based on a 4-night-time period of baseline sound monitoring including a weekend at NSR.
Note 3: Column 6 is calculated by the logarithmic addition of columns 3 (minus 3dB) and column 4 **Leq** level in [ ] and subtraction of the background **Leq** noise level (i.e. column 4 in [ ]).

7.4.37 According to BS4142: 2014+A1:2019[5], the rating level relative to the assessment baseline noise indicates in general a ***negligible to slight*** impact magnitude (refer to Table 7.8). The operational noise impacts from the facility are therefore considered to represent a ***neutral to minor*** level of effect and therefore ***not significant***. The result shows that with typical embedded mitigation measures the impact according to BS4142:2014+A1:2019 is ***below an adverse impact*** and additional noise mitigation measures are proposed, which is detailed in section 7.5.

7.4.38 In relation to the IEMA guidelines and making reference to Table 7.9, it can be seen that the magnitude of the impact during night-time periods (final column of table) shows that the change in noise level ranges between +0.3dB and +0.6dB L_{Aeq} which indicate a ***negligible*** impact**.** The predicted level of effect would therefore be ***neutral*** for all residential NSR in relation to this guidance.

Ecological Receptors

7.4.39 The nearest ecological sensitive receptors to the Site have been considered and according to the 'Ecology and Nature Conservation' chapter of the ES (Chapter 6.0), the `Waterbird Disturbance and Mitigation Toolkit' provides guidance on acceptable levels of noise. The guidance at the distance to the noise source for this Site would indicate a level of 55dB L_{Aeq} for long term regular noise would be acceptable (i.e. operational noise).

7.4.40 The predicted noise level during the daytime at the ecological receptors (i.e. passage and wintering birds within the saltmarsh and mudflats adjacent to the River Wyre) with the embedded noise mitigation measures is provided below in Table 7.21.

Table 7.21: Predicted Noise Levels from Proposed Development during Daytime & Night-time Operations (with Embedded Noise Mitigation Measures) at Ecological Receptors

Receptor Position (Refer to Figure 7.1)	Time Period	Predicted Noise Level from Site $LAeq,_T$ dB	Assessment[2] Reidual Sound Level LAeq [LAmax]	TIDE[15] Assessment Guidance [$LAeq,_T$]	Difference between predicted site noise & guidance $LAeq,_T$ dB
Ecological Receptors					
E1: River Wyre (east of Site)	0700-2300	51-60	52 [41-89]	55	-4 to +5
	2300-0700	51-60	52 [41-80]	55	-4 to +5

7.4.41 The predicted operational noise levels at the ecological NSR with the <u>embedded</u> noise mitigation measures shows noise levels need to be reduced to comply with the assessment guidance as advised by the Waterbird Disturbance and Mitigation Toolkit'[15]. Additional mitigation measures are provided in section 7.6.

7.4.42 The impact of Site operational noise on ecological receptors does exceed the TIDE guidance levels and is therefore considered to represent a **moderate** impact and **moderate** level of effect.

Users of PROW along Wyre Way

7.4.43 The nearest PROW to the Site is Wyre Way footpath which follows the eastern boundary of the Hillhouse Business Park. This is currently subject to existing industrial noise activities and the section that is adjacent to the Proposed Development boundary extends to a distance of circa 300m. The extent of any operational noise is therefore relatively short in terms of time and experience as this is a transient event, would only be relevant to daytime periods and therefore considered less sensitive than a permanent resident. Table 7.22 provides the range of predicted noise levels along the footpath adjacent to the Site boundary assuming embedded mitigation measures.

Table 7.22: Predicted Noise Levels from Proposed Development during Daytime Operations (with Embedded Noise Mitigation Measures) at the PROW

Position (Refer to Figure 7.1)	Time Period	Predicted Noise Level from Site $L_{Aeq,T}$ dB	Measured Residual Sound Level LAeq
R3: Wyre Way PROW	0700-2300	52-66	34-62

7.4.44 The predicted noise levels along the PROW with the embedded noise mitigation measures shows transient noise levels along the Wyre Way footpath adjacent to the Site to range between 52dB and 66dB L_{Aeq} without additional mitigation measures. As this is a short-term transitionary impact along a footpath, the effect is not significant. However, further additional measures are detailed in Section 7.7 which will reduce the predicted levels further and result in the predicted range falling to within the range measured at this location.

Decommissioning Phase

7.4.45 Noise and vibration associated with the decommissioning of the facility is likely to involve cleaning, electrical isolation of plant, demolition work, foundation removal (as required) and landscaping works to restore the land. The type of plant will generally involve very similar plant to that assumed for the construction phase with the exception of piling which would be replaced with the use of demolition excavators and some specialist power tools. The predicted noise and vibration levels are expected to be lower than that predicted for the construction phase and therefore the associated impacts similar or lower.

7.4.46 The timing and precise phasing of the different elements of decommissioning and restoration are not known in detail. However, the decommissioning would be managed in accordance with a Decommissioning Environmental Management Plan (DEMP).

7.4.47 As part of the DEMP, a Noise Management Plan will be set out to ensure that the impacts of decommissioning phase comply with BPM.

7.4.48 It is not considered that the level of traffic associated with the decommissioning phase will be materially different to that generated by the operational phase and therefore the impact would be ***negligible to slight*** and a ***neutral to minor*** level of effect at residential NSR and ecological NSR ***slight to moderate*** and ***not significant***.

Operational Road Traffic Noise

7.4.49 The Transport Statement (Es Appendix 5.1) considers the assessment years (2026 and 2031) for the traffic demand from the Proposed Development for these periods, compared to a 'Do-nothing' scenario. Tables 7.23 to 7.24 below provide details of the noise impact due to the increased traffic flow along the local road network based on a 13-hour average and peak hour demand for the `core scenario' and `sensitivity test' using the traffic data provided within the Transport Statement.

Table 7.23: Predicted Change in Road Traffic Noise on Local Road Network based on Weekday Daytime 13-hour weekday & Saturday Site Vehicle Demand

Road	Assessment Year	'Do nothing' $L_{A10,13hrs}$ (dB)	'Do something' Scenario $L_{A10,13hrs}$ (dB)	'Do something' Sensitivity Test $L_{A10,13hrs}$ (dB)	Change (with development) $L_{A10,13hrs}$ (dB)	Increase above threshold $L_{Aeq,13hrs}$ dB
Bourne Way	2026 (week) 2026 (Sat) 2031 (week) 2031 (Sat)	61.5 55.9 61.9 56.1	63.0 58.8 63.3 58.9	58.8 58.9	+1.5 +2.9 +1.4 +2.8	+2.9 +2.8
Bourne Road	2026 (week) 2026 (Sat) 2031 (week) 2031 (Sat)	61.2 55.9 62.3 56.1	62.8 58.8 63.6 58.9	58.8 58.9	+1.6 +2.9 +1.3 +2.8	+2.9 +2.8
Fleetwood Rd	2026 (week) 2026 (Sat) 2031 (week) 2031 (Sat)	61.2 56.0 61.6 56.2	62.8 58.8 63.1 58.9	58.8 58.9	+1.6 +2.8 +1.5 +2.7	+2.8 +2.7
Amounderness Way (north)	2026 (week) 2026 (Sat) 2031 (week) 2031 (Sat)	66.2 61.5 66.5 61.8	66.4 61.8 66.7 62.1	61.5 61.8	+0.2 +0.3 +0.2 +0.3	0 0
Amounderness Way (south)	2026 (week) 2026 (Sat)	67.1 62.3	67.4 61.8	63.2	+0.3 +0.3	+0.9

	2031 (week)	67.4	67.7		+0.3	
	2031 (Sat)	62.6	63.2	63.4	+0.6	+0.8

7.4.50 Based on a maximum HGV demand using a 13-hour weekday or Saturday time period, the impact shows ***negligible*** to ***slight*** impact magnitude and ***neutral*** to ***minor*** level of effect in respect of traffic movements relative to the nearest local road network and at nearest residential properties.

Table 7.24: Predicted Change in Road Traffic Noise on Local Road Network based on Weekday Daytime peak hour weekday & Saturday Site Vehicle Demand

Road	Assessment Year	'Do nothing' $LA10_{1hr}$ (dB)	'Do something' Core Scenario $LA10_{1hr}$ (dB)	Change (with development) $LA10_{1hr}$ (dB)
Bourne Way	2026 AM	62.7	63.9	+1.2
	2026 PM	62.6	63.8	+1.2
	2031 AM	63.4	64.5	+1.1
	2031 PM	63.0	64.1	+1.1
Bourne Road	2026 AM	62.3	63.6	+1.3
	2026 PM	61.6	63.1	+1.5
	2031 AM	62.8	64.0	+1.2
	2031 PM	62.3	63.6	+1.3
Fleetwood Rd	2026 AM	62.7	63.9	+1.2
	2026 PM	62.3	63.6	+1.3
	2031 AM	63.1	64.2	+1.1
	2031 PM	62.7	63.9	+1.2
Amounderness Way (north)	2026 AM	67.8	67.9	+0.1
	2026 PM	67.4	67.6	+0.2
	2031 AM	67.8	67.9	+0.1
	2031 PM	67.8	67.9	+0.1
Amounderness Way (south)	2026 AM	68.6	68.8	+0.2
	2026 PM	68.3	68.6	+0.3
	2031 AM	68.6	68.8	+0.2
	2031 PM	68.6	68.8	+0.2

7.4.51 Based on a maximum HGV demand and peak hour period assessment, the impact shows ***negligible*** impact magnitude and ***neutral*** level of effect in respect of traffic movements relative to the nearest local road network and at nearest residential properties. In terms of the DMRB[8] guidance, in relation to short-term effects (refer to Table 7.10) an increase of <3dB(A) is minor and <1dB(A) is negligible.

Operational Vibration

7.4.52 In respect of ground-borne vibration during the operational phase, the type of equipment and mobile plant by its nature is not expected to generate any significant vibration and where vibration exists that affect fixed plant operations (such as driven rotational plant such as generators) it would be fitted with anti-vibration mounts. In view of this point and distance separation to NSR we conclude that this does not require further analysis and impacts would be ***negligible*** and a ***neutral*** effect and **not significant**.

7.5 Cumulative Effects

7.5.1 The following paragraphs describe the information available with respect to the consideration of cumulative effects in terms of noise, provide a summary of the likely noise contribution from the relevant developments to the NSRs considered in this Chapter, and conclude on the potential for cumulative effects.

7.5.2 The permitted **residential development** for 210 dwellings on land off Bourne Road (Ref: 20/00405/LMAJ) is located approximately 970m northwest of the Proposed Development. There are no specific noise sources from this type of development other than temporary construction works and operational vehicle movements. The predicted noise contribution from the Proposed Development is expected to be below 20dB LAeq, which is insignificant. In view of the type of development and significant separation distance, there is no likelihood of cumulative impacts.

7.5.3 The permitted **residential development** for a full permission for 41 dwellings and outline for up to 45 dwellings and 42 apartments at the site of the Thornton-Cleveleys Football Club off Bourne Road (Ref: 19/00347/FULMAJ) is located approximately 1.4km northwest of the Proposed Development. There are no specific noise sources from this type of development other than temporary construction works and operational vehicle movements. In view of the type of development and significant separation distance, there is no likelihood of cumulative impacts.

7.5.4 The permitted **Energy Recovery Centre** (ERC) (Ref. LCC/2023/0003) is located on the Hillhouse Business Park at approximately 600m northwest of the Proposed Development. The predicted noise contribution from the (ERC) relative to the Site NSR is predicted to be at least 10dB(A) below the predicted noise level from the Proposed Development and well below the existing ambient noise and therefore would not contribute further to the predicted levels. There is therefore no likelihood of cumulative impacts.

7.5.5 The permitted **residential development** for the erection of 158 dwellings at Bourne Hill, Fleetwood Road North (Ref: 22/00762/FULMAJ) is located approximately 1.6km northwest of the Proposed Development. There are no specific noise sources from this type of development other than temporary construction works and operational vehicle movements. In view of the type of development and significant separation distance, there is no likelihood of cumulative impacts.

7.5.6 The permitted development for the **storage of hazardous waste within the wider Victrex facility** (Ref: LCC/2022/0056). This development is located immediately north of the Proposed Development and the application relates to waste currently being stored on site in an un-covered clean reinforced concrete hardstanding and the proposals are to construct a building to store the waste to ensure this is located within a sealed cover area. This means that any noise generated by the existing development would effectively be reduced from site. There is therefore no likelihood of cumulative impacts.

7.5.7 The permitted development for a new industrial unit (and demolition of the existing unit) in the form of a building for **vehicle repairs and servicing**, which is located at the north-western edge of the Hillhouse Enterprise Zone approximately 960m from the Site (Ref: 23/01099/FUL). The proposed activities would be contained within a new building with self-closing doors and as such the level of noise radiating from the development would not be significant and would not contribute to any cumulative impacts at NSR in conjunction with the Proposed Development.

7.5.8 The permitted development for the **stationing of caravans, use of land as boat park** and conversion of buildings to form riding stables (pursuant to variation of condition 1 to allow the use of the approved holiday caravan park on a year round basis on planning application 3/6/3857 (Ref. 22/00672/FUL). This allows for caravans to be stationed up to the northwestern corner of the caravan site. The noise predictions allow for this receptor location in the assessment of impacts. There is no cumulative impacts associated with this

7.5.9 The pending hybrid development for 1) Full planning application for the erection of 80 dwellings with vehicular access from Lambs Road and to land to the east (phase 3) and pedestrian access to land to the south (phase 1) and associated works to include landscaping and green infrastructure 2) **Outline planning application for the erection of up to 194 dwellings, a one-form entry primary school (1.36ha) and a convenience retail store** (up to 280sqm net sales floorspace) with associated works (all matters reserved for subsequent approval) (variation of conditions 2 (plans), 11 (parking), 22, (landscaping), 24 (land levels) and 27 (adaptable housing) on planning permission 20/01018/LMAJ (Ref. 23/01110/LMAJ). Planning application

20/01018/LMAJ was approved in September 2023. This development is located circa 900m south of the Site. The application planning consent conditions for the permitted development requires a Construction and Environmental Management Plan (CEMP) which includes for the provision of the control of noise and vibration and a noise assessment to show compliance with specific noise limits. In view of the separation distance from Site and conditioning controls in place, there is no likelihood of cumulative impacts.

Future Baseline

7.5.10 The effect of the Proposal on existing sound levels at NSR has been found to be ***negligible*** and therefore ***no significant effect*** on future baseline levels would occur.

7.6 Mitigation

Construction & Decommissioning Noise

7.6.1 In accordance with BS5228[7], BPM would be employed to control the noise generation (e.g. using equipment that is regularly maintained, where practicable use equipment fitted with silencers or acoustic hoods).

7.6.2 In consideration of the likely highest levels of construction and decommissioning noise, the following approach would be considered as part of any Construction Environmental Management Plan (CEMP) and any future DEMP:

- Restriction of hours to non-sensitive times of day would normally form part of the planning consent conditions.
- Careful choice of piling rigs to minimise noise (e.g. hydraulic or CFA piling) where practicable, subject to ground conditions.
- Avoid un-necessary plant operation and revving of plant or vehicles.
- Locate plant away from nearest sensitive receptors or in locations which provide good screening in the direction of sensitive receptors.
- Use of broadband noise reverse alarms (where practicable) on mobile plant.
- Where appropriate, use of acoustic hoods or enclosures for static plant (e.g. compressors or generators).
- Use of hoarding screens along the eastern side of the Site to reduce noise for users of the coastal path and to minimise noise levels.

- Consider using a one-way system/turning circle and/or use of a banksman to avoid/reduce the need for reverse alarms.
- Battery operated tools would be used rather than compressed air tools, wherever practicable.
- Community Relations – this is one of the most important aspects of mitigation as providing the local residents with clear information of the activities that would be taking place and the length of time that any peak noise levels may occur will assist in allaying people's fears. BS5228 states *"It is suggested that good relations can be developed by keeping people informed of progress and by treating complaints fairly and expeditiously. The person, company or organisation carrying out the work on site should appoint a responsible person to liaise with the public."*

7.6.3 With the application of BPM and the proposed approach to noise control measures set out above, the resultant construction and decommissioning noise levels at residential NSR would be minimised, with the impact magnitude classification remaining at ***negligible to slight*** *and* a ***neutral to minor*** level of effect and therefore ***not significant***.

7.6.4 In respect of the ecological NSR, the effect of the mitigation measures set out above would result in a change in impact from a *slight to moderate* to a ***slight*** impact and from a *minor to moderate* to a ***minor*** level of effect and therefore **not significant**.

Construction Vibration

7.6.5 In accordance with BS5228[7], BPM would be employed to control vibration generation, which could involve the use of one or more of the following measures:

- Where practicable the use of continuous flight auger piling or hydraulic piling techniques to avoid impulsive vibration peaks (as practicable and appropriate for the ground conditions). Where this is not practicable, avoidance of the sensitive bird activity during the period between September and March should be considered in the CEMP and where concrete breakers and demolition excavators are used during the decommissioning phase in the future DEMP.
- Where practicable, removal of obstructions within the ground to provide reduction

in resistance to driving of piles into the ground.

7.6.6 The effect of the mitigation measures would assist in minimising and maintaining the predicted impact at the residential NSR of ***negligible*** and a ***neutral*** effect. At the ecological NSR, by introducing non-impulsive piling techniques the level of vibration would fall below a perceptible level and the impact would reduce to a ***negligible*** and a ***neutral*** level of effect and **not significant**. if this type of piling is not practicable, then avoiding the sensitive bird activity period would also reduce the impact to **negligible**.

Operation Noise

Additional Noise Mitigation

7.6.7 The embedded mitigation measures described previously (i.e. paragraph 7.4.1) do not adequately address the needs to avoid adverse effects of the Proposed Development. In order to comply with the relevant standards and guidance for noise, further noise mitigation would be required. These could include the following additional measures (i.e. the list includes any embedded measures which are still relevant, as detailed in section 7.4.1) which are all standard commonly applied forms of mitigation which can be applied:

a) IBA Storage contained within a building.
b) IBA Storage building to have an internal dividing wall between the IBA Input Storage Area and the processed IBA storage area via single skin cladding to Rw=24dB or greater.
c) The walls and roof of the IBA processed storage area (i.e. the two sections of the IBA storage building closest to the site entrance) formed by single skin cladding to Rw=24dB or greater.
d) IBA input Storage Area rear facade (southwest) façade constructed from double skin insulated cladding to a minimum of Rw=38dB and lower concrete walls (nominally 3m in height) where material storage and bulking required.
e) Northwest façade of IBA Storage Building wall and roof formed by single skin cladding to minimum Rw24dB. Lower wall formed by concrete (nominally 3m in height) where material storage and bulking required.
f) Roof of the IBA Input Storage Area to be formed by cladding having an absorbent acoustic lining (minimum Rw=34dB). No skylights to be fitted into the roof design.

The absorbent roof lining provides a reduction in reverberant noise build up in the building to minimise noise `break-out' via the open side of the building.

g) Processing plant building constructed from double skin insulated cladding to a minimum of Rw=38dB.
h) Door into the Processing plant closed except for access to vehicles for offloading and collection unless for maintenance or emergency formed by an electric insulated roller shutter door (Rw typically 18dB).
i) Conveyors between the Processing Building and the IBA Storage Building to be enclosed with single skin cladding or similar to Rw=24dB.
j) Any openings around conveyors into the Processing Building walls to be acoustically treated to minimise noise `break-out' via closure plates or cladding.
k) Metal storage contained within a building with partial open front.
l) Metal Storage building walls and roof constructed from double skin insulated cladding to a minimum of Rw=38dB and lower concrete walls (nominally 3m in height) where material storage and bulking required. Opening required at the SW wall to be centralised to the opening and the sidewalls to the opening closed off using acoustic cladding to Rw=38dB.
m) Design to ensure no noise character is perceptible at NSR in accordance with BS4142: 2014+A1:2019.
n) Sound power levels of plant as detailed in Appendix 7.4.
o) Mobile plant and site-controlled vehicles fitted with non-tonal reversing alarms (i.e. broadband noise, `white noise' or SMART type reversing alarms).

7.6.8 There are a number of different ways in which the criteria can be achieved, for example, the use of noise control at source and / or the selection of different plant equipment, which may be quieter, can be investigated. The chosen method(s) of mitigation should be appropriate to meet the noise criteria and the application of BAT. The aforementioned measures are just one combination that would be effective in achieving the requisite noise levels during the daytime and night-time periods.

7.7 Residual Effects and Conclusions

7.7.1 During the construction period there would be a variety of noise sources in use at different stages and their associated activities would vary from day to day. The highest noise levels relative to nearest receptors are likely to occur during initial ground works, piling and infrastructure activities and when the building steelwork is being constructed. The peak noise activities do not normally occur over long periods of time and BPM would be employed to control the noise being generated. It is concluded that the increase in construction noise with the implementation of mitigation measures, using BPM, is likely to result in an impact magnitude classification of ***negligible*** at residential NSR and a ***neutral*** level of effect. At commercial and ecological NSR the application of BPM would result in an impact magnitude to ***slight*** and a ***minor*** level of effect, which is ***not significant***.

7.7.2 The assessment of impact on existing residential areas from any increase in road traffic noise during the daytime construction or operational stage of the Proposed Development shows no significant change in noise levels and therefore there is likely to be a ***negligible*** to ***slight*** impact at receptors and ***neutral*** to ***minor*** level of effect and ***not significant***.

7.7.3 In terms of vibration during the construction or operational period, there would be a ***negligible*** impact and ***neutral*** significance at the nearest residential receptor and well within guidance limits for nuisance and cosmetic damage. At office and ecological NSR the highest impact would also be ***negligible*** and a ***neutral*** effect with proposed mitigation, and ***not significant***.

Daytime Operation

7.7.4 The following analysis considers the residual effect of the additional mitigation measures on the predicted operational noise levels. Table 7.25 below provides information on the predicted noise levels during daytime operations (07.00 to 23.00).

Table 7.25: Predicted Noise Levels from Proposed Development during Daytime Operations (with Additional Noise Mitigation Measures)

Receptor Position (Refer to Figure 7.1)	Time Period	Predicted Rating[1] Noise Level from Site L_{Aeq1hr} dB	Assessment[2] Baseline Sound Level L_{A90} dB [L_{Aeq}]	Rating[1] compared to Baseline Sound L_{Aeq1hr} dB	Noise Change[3] L_{Aeq1hr} dB
Residential Receptors					
R1: Roscoe Avenue & Bentley Green (south-west of Site)	0700-2300	36-38	42 [52]	-6 to -4	+0.1 to +0.2
R2: Caravan Park (southeast and east of Site)	0700-2300	41-45	46 [51]	-5 to -1	+0.4 to +1.0

Note 1: With the proposed additional mitigation measures any noise characteristics at receptor locations is **not** expected to be perceptible due to the site contribution relative to the ambient noise level at NSR.
Note 2: Based on a 5-day period of baseline sound monitoring including a weekend at NSR.
Note 3: Column 6 is calculated by the logarithmic addition of columns 3 and column 4 **Leq** level in [ ] and subtraction of the background **Leq** noise level (i.e. column 4 in [ ]).

7.7.5 The predicted noise levels reflect site attributable noise with the additional noise control measures. The fifth column in Table 7.25 shows the difference between the predicted rating noise level and assessment baseline sound level at the receptor positions. The assessment includes a noise character penalty for robustness and in accordance with the EA guidelines. The rating level in column five is therefore in accordance with the methodology found within BS 4142: 2014+A1:2019[5], which is the most relevant applicable noise assessment guidance.

7.7.6 According to BS4142: 2014+A1:2019[5], the rating level relative to the assessment baseline noise would indicate ***negligible*** impact magnitude at all residential NSR (refer to Table 7.10). The operational noise impacts from the facility are therefore considered to represent a ***neutral*** level of effect, and ***not significant****.* According to BS4142:2014+A1:2019 the impact would be a ***low impact***.

7.7.7 In relation to the IEMA guidelines[16] (which considers the increase in existing residual noise and therefore the context of the impact, reference Table 7.11), it can be seen that the magnitude of the impact during daytime periods (final column of table) shows that there is an increase between +0.1dB and 1dB $L_{Aeq,1hr}$ in noise level, which indicates a ***negligible*** impact**.** The predicted level of effect that would be experienced by residential receptors would therefore be ***neutral*** and ***not significant***.

Ecological Receptors

7.7.8 The predicted noise level during the daytime at the ecological receptors with the additional noise mitigation measures is provided below in Table 7.26.

Table 7.26: Predicted Noise Levels from Proposed Development during Daytime & Night-time Operations (with Additional Noise Mitigation Measures) at Ecological Receptors

Receptor Position (Refer to Figure 7.1)	Time Period	Predicted Noise Level from Site $LAeq_{,T}$ dB	Measured Reidual Sound Level LAeq [LAmax]	TIDE Assessment Guidance [$LAeq_{,T}$]	Difference between predicted site noise & guidance $LAeq_{,T}$ dB
Ecological Receptors					

Receptor Position (Refer to Figure 7.1)	Time Period	Predicted Noise Level from Site $L_{Aeq,T}$ dB	Measured Reidual Sound Level L_{Aeq} [L_{Amax}]	TIDE Assessment Guidance [$L_{Aeq,T}$]	Difference between predicted site noise & guidance $L_{Aeq,T}$ dB
E1: River Wyre (north to northeast of Site)	0700-2300 2300-0700	48-55 46-55	52 [41-89] 52 [39-80]	55 55	-7 to 0 -9 to 0

7.7.9 The predicted noise levels at the ecological receptors with the additional noise mitigation measures shows compliance with the assessment guidance as advised by TIDE[15].

7.7.10 The impact of Site operational noise on ecological receptors does not exceed the TIDE guidance levels and is therefore considered to represent a **negligible** impact and **neutral** effect and **not significant**.

Night-time Operation

7.7.11 The following analysis considers the residual effect of the additional mitigation measures on the predicted night-time operational noise levels. Table 7.27 below provides information on the predicted noise levels during night-time operations (23.00 to 07.00).

Table 7.27: Predicted Noise Levels from Proposed Development during Night-time Operations (with Additional Noise Mitigation Measures)

Receptor Position (Refer to Figure 7.1)	Time Period	Predicted Rating[1] Noise Level from Site $L_{Aeq15mins}$ dB	Assessment[2] Baseline Sound Level L_{A90} dB [L_{Aeq}]	Rating[1] Level compared to Baseline Sound L_{A90} dB	Noise Change[3] L_{Aeq} dB
Residential Receptors					
R1: Roscoe Avenue & Bentley Green (south-west of Site)	2300-0700	35-37	40 [48]	-5 to -3	+0.2 to +0.3
R2: Caravan Park (south east and east of Site)	2300-0700	38-41	44 [51]	-6 to -3	+0.2 to +0.4

Note 1: With the proposed additional mitigation measures any noise characteristics at receptor locations is **not** expected to be perceptible due to the site contribution relative to the ambient noise level at NSR.
Note 2: Based on a 4-day period of baseline sound monitoring including a weekend at NSR.
Note 3: Column 6 is calculated by the logarithmic addition of columns 3 and column 4 **Leq** level in [ ] and subtraction of the background **Leq** noise level (i.e. column 4 in [ ]).

7.7.12 According to BS4142: 2014+A1:2019[5], the rating level relative to the assessment baseline noise indicates a ***negligible*** impact magnitude (refer to Table 7.10). The operational noise impacts from the facility are therefore considered to represent a ***neutral*** level of effect and ***not significant***. The result shows a ***low*** impact according to BS4142[5] with the additional noise mitigation measures.

7.7.13 In relation to the IEMA guidelines[16] and making reference to Table 7.11, it can be seen that the magnitude of the impact during night-time periods (final column of table) shows that the change in noise level ranges between +0.2dB and +0.4dB LAeq which indicate a ***negligible*** impact**.** The predicted level of effect would therefore be ***neutral*** for all NSR in relation to this guidance.

Users of PROW along Wyre Way

7.7.14 Table 7.28 provides the predicted noise level range along the Wyre Way footpath as it passes the boundary of the Proposed Development with the additional mitigation measures in place during daytime operations.

Table 7.28: Predicted Noise Levels from Proposed Development during Daytime Operations (with Additional Noise Mitigation Measures) along the PROW

Receptor Position (Refer to Figure 7.1)	Time Period	Predicted Noise Level from Site $LAeq_{,T}$ dB	Measured Residual Sound Level $LAeq_{15mins}$
PROW Receptors			
R3: Wyre Way PROW	0700-2300	49-60	34-62

7.7.15 The predicted noise levels along the PROW with the additional noise mitigation measures shows transient noise levels along the stretch of Wyre Way footpath adjacent to the Site, to range between 49dB and 60dB L_{Aeq}. This compares with the measured range of $L_{Aeq,15min}$ baseline readings, which showed a level between 34dB to 62dB $L_{Aeq,15mins}$.

7.7.16 In summary, no significant noise effects have been identified by the noise assessment in relation to construction or operation of the Proposed Development noise or plant vibration. Table 7.29 below summarises the predicted effects of the construction, and operation of the development.

Table 7.29: Residual Impact at Nearest Receptor after Additional Mitigation Measures

Source	Nature of Effect	Time Period	Impact Magnitude	Level of Significance
Construction noise	Temporary	Daytime	Negligible to Slight	Neutral to Minor
Decommission noise	Temporary	Daytime	Negligible to Slight	Neutral to Minor
Road traffic noise (construction)	Temporary	Daytime	Negligible to Slight	Neutral to Minor
Construction vibration	Temporary	Daytime	Negligible	Neutral
Decommission vibration	Temporary	Daytime	Negligible	Neutral
Operation vibration	Permanent	Daytime Night-time	Negligible Negligible	Neutral Neutral
Industrial noise (Site operation)	Permanent	Daytime Night-time	Negligible Negligible	Neutral Neutral
Road traffic noise (operation)	Permanent	Daytime	Negligible to Slight	Neutral to Minor
Cumulative Effects	Permanent	Daytime Night-time	Negligible Negligible	Neutral Neutral

Conclusions

7.7.17 Noise and vibration levels have been considered and assessed during the construction, operational and decommissioning phases of the Proposed Development. Relevant and appropriate noise and vibration guidance and standards have been used to determine the impact. The assessment has been undertaken to inform and guide the design of the Proposed Development, such that any likely noise and vibration impact on existing and potential sensitive receptors is minimised.

7.7.18 To establish any likely impact from noise, a robust assessment of baseline sound levels has been considered by undertaking fixed position noise monitoring at three noise sensitive receptor areas around the Site, over a four-day period including a weekend.

7.7.19 Pre-application advice was provided by Lancashire County Council which requested background sound levels to be assessed during daytime and night-time periods and impacts to be assessed against BS4142 during operational periods proposed and detail to be provided of any mitigation measures to reduce noise.

7.7.20 In accordance with appropriate standards, BPM would be employed to control the noise generation during the construction and future de-commissioning period. Measures may include restriction on operating hours, and careful choice of piling rigs to minimise noise. Such measures would be defined within the CEMP and future DEMP.

7.7.21 In relation to the operational phase, a number of potential mitigation measures have been proposed to ensure that the resultant operational noise levels are within appropriate guidance and standards to avoid adverse impacts. The measures would be based on the employment of BAT to mitigate any potential peak noise sources.

7.7.22 Consideration of the impacts on the ecological sensitive receptors have been assessed and mitigation measures detailed to minimise and control noise and vibration have been provided during construction and operation periods.

7.7.23 Permitted or proposed development in the vicinity of the Proposed Development have been considered and it is concluded that there is no likelihood of cumulative impacts from these sites.

7.7.24 The assessment shows that there would be ***no significant impacts*** during the construction, operation or de-commissioning of the Proposed Development following the implementation of appropriate mitigation.

Appendix 7.1 –

Basic Acoustic Terminology

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.

Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure level. It is because of this wide range that a noise level scale based on logarithms is used in noise measurement. This is the decibel or dB scale.

Audibility of sound covers a range of about 0 to 140 decibels (dB) corresponding to the intensity of the sound pressure level. The ability to recognise a particular sound is dependent on the pitch or frequencies present in the source. Sound pressure measurements taken with a microphone cannot differentiate in the same way as the ear, consequently a correction is applied by the noise measuring instrument in order to correspond more closely to the frequency response of the ear which responds to sounds from 20 Hz to 20000 Hz. This is known as 'A weighting' and written as dB(A).

The use of this unit is internationally accepted and correlates well with subjective annoyance to noise.

The logarithmic basis of noise measurements means that when considering more than one noise source their addition must be undertaken in terms of logarithmic arithmetic. Thus, two noise sources each of 40 dB(A) acting together would not give rise to 40 + 40 = 80 dB(A) but rather 40 + 40 = 43 dB(A). This 3dB(A) increase represents a doubling in sound energy but would be only just perceptible to a human ear.

The attached chart gives typical noise levels in terms of dB(A) for common situations.

Noise levels can vary with time according to source activity and indices have been developed in order to be able to assign a value to represent a period of noise level variations and to correspond with subjective response.

The definition in layman's terms is given below for terminology used in the measurement and results obtained during the survey work.

- **A-weighting:** Normal hearing covers the frequency (pitch) range from about 20Hz to 20,000 Hz but sensitivity of the ear is greatest between about 500Hz and 5000Hz. The "A-weighting" is an electrical circuit built into noise meters to mimic this characteristic of the human ear.
- **Ambient noise:** The totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.
- **Attenuation:** Noise reduction
- **Background noise:** The general quiet periods of ambient noise when the noise source under investigation is not there.
- **Decibel (dB):** The unit of measurement for sound based on a logarithmic scale. 0dB is the threshold of normal hearing; 140dB is the threshold of pain. A change of 1dB is only detectable under controlled laboratory conditions.
- **dB(A) [decibel A weighted]:** Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) serves to distinguish sounds of different frequency (or pitch) in a similar way to how the human ear responds. Measurements in dB(A) broadly agrees with an individual's assessment of loudness. A change of 3dB(A) is the minimum perceptible under normal everyday conditions, and a change of 10dB(A) corresponds roughly to doubling or halving the loudness of sound.
- **dB(C): [decibel C weighted]:** Frequency weighting which does not alter low frequency octave band levels by very much compared to ‘A' weighting. Similar to linear reading (i.e. linear does not alter frequency spectra at all)
- **Frequency (Hz):** The number of sound waves to pass a point in one second.
- **L_{Aeq}:** This is a noise index used to describe the “average” level of a noise that varies with time (T). It allows for the different sensitivities of the human ear to different frequencies (pitch), and averages fluctuating noise levels in a manner, which correlates well with human perceptions of loudness.

- **$L_{A10,T}$:** This noise index gives an indication of the upper limit or peak levels of the fluctuating noise. It is the "A weighted" noise level exceeded for 10 per cent of the specified measurement period (T). e.g. If the measurement period was over 10 hours and the L_{A10} reading was say 60dB, then this means that for 1 hour out of 10 the level went above 60dB.
- **$L_{A90,T}$:** This noise index gives an indication of the lower limit or levels of the fluctuating noise. It is the "A weighted" noise level exceeded for 90 per cent of the specified measurement period (T). e.g. If the measurement period was over 10 hours and the L_{A90} reading was say 50dB, then this means that for 9 hours out of 10 the level went above 50dB.
- **L_{Amax}:** This is the highest A weighted noise level recorded during a noise measurement period.
- **$L_{night,outside}$:** This is the A-weighted long-term average sound level measured outside as defined in ISO 1996-2: 1987, determined over all the night periods of a year.
- **Residual noise:** The ambient noise remaining at a given position in a given situation when the noise source under investigation is not there.
- **Specific noise:** The noise source under investigation for assessing the likelihood of complaints.

Examples of typical noise levels

Source/Activity	Indicative noise level [dB(A)]
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind farm at 350m	35-45
Busy road at 5km	35-45
Car at 65km/h at 100m	55
Busy general office	60
Conversation	60
Truck at 50km/h at 100m	65
City Traffic at 5m	75-85
Pneumatic drill at 7m	95

Jet aircraft at 250m	105
Threshold of pain	140

Appendix 7.2 – Baseline Survey Details

NOISE INSTRUMENTATION, METHODOLOGY & SURVEY DETAILS

Survey Methodology

Instrumentation and Fieldwork Details

The background sound measurements used in the assessment were undertaken in April 2024. The measurements were undertaken in proximity to accessible nearest sensitive receptors to identify typical baseline sound levels. The monitoring of residual and background sound was carried out during a weekday and weekend period such that the lowest likely representative background sound levels could be included for the assessment.

The following instrumentation was used for all noise measurements:

November 2023

Manufacturer	***Description***	***Type***	***Calibration Due date***	***Serial***
Cirrus	Real Time Analyser	CR:171A	July 2024	G061253
Cirrus	Real Time Analyser	CR:171B	April 2025	G056142
Cirrus	Real Time Analyser	CR:1710	March 2025	G304789
Cirrus	Acoustic Calibrator	CR: 531A	May 2024	031523

The following set-up parameters were used on the sound level meters during noise measurement:

Static Noise Monitoring:
Time Weighting: Fast
Frequency Weighting: 'A'
Measurement Period: 15minute intervals

Calibration
Calibration setting: 94dB

The noise meters were calibrated with the electronic calibrator prior to commencement and on completion of the Survey. No significant drift in calibration was observed.

Survey Dates and Personnel

Baseline Survey – Thursday 18th to Monday 22nd April 2024

Static noise measurement positions in April 2024 were chosen following liaison with the Business Park to carry out monitoring at or in proximity to NSR to the Site to establish typical baseline sound level data (see Appendix 7.3 for detailed information). Mr. D.R. Kettlewell of Noise & Vibration Consultants Limited set up and retrieved the monitoring equipment.

Measurements were recorded at three fixed monitoring positions during daytime and night-time periods (i.e. A to C as shown on Figure 7.1). Data logging of L_{Aeq}, L_{A10}, L_{A90} and L_{Amax} were recorded at 15-minute intervals for information on the variation of typical baseline sound levels.

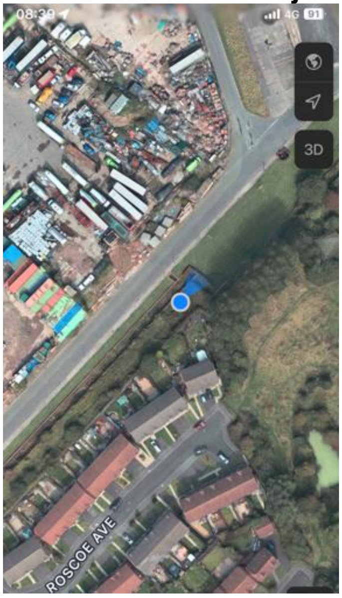
The noise meters were mounted on a tripod at a height of circa 1.5 metres above ground level and fitted with a wind and rain shield.

Meteorological Conditions

Weather details were recorded by the NVC Consultant using a Davis Vantage Vue weather station (model 6250UK, product no.#6351UK) during the period of the Survey. Any unsuitable monitoring periods were removed from the data set (i.e. high winds or rain or temperatures below zero) as detailed below.

Photographs of Monitoring Positions

Position A: Land Adjacent to Nearest Property off Roscoe Avenue



Weather Station adjacent to Roscoe Avenue Receptors

Position B: Adjacent to Caravan Park Boundary

Weather Conditions During Baseline Sound Survey

Date	Time	Temp Out	Wind Speed	Wind Dir	Wind Run	Bar	Rain
18/04/2024	18:00	9	0	W	0	771.7	0
18/04/2024	18:30	9.2	0	W	0	772.1	0
19/04/2024	19:00	9.3	0	W	0	772.5	0
19/04/2024	19:30	9.3	0	W	0	773	0
19/04/2024	20:00	9.4	0	W	0	773.4	0
19/04/2024	20:30	9.3	0	W	0	773.3	0
19/04/2024	21:00	9.3	0	W	0	773.7	0
19/04/2024	21:30	9.2	0	W	0	773.9	0
19/04/2024	22:00	9.1	0	W	0	774.1	0
19/04/2024	22:30	9	0	W	0	774.1	0
19/04/2024	23:00	9	0	W	0	774.2	0
19/04/2024	23:30	8.9	0	W	0	774.3	0
20/04/2024	00:00	9	0	W	0	774.3	0
20/04/2024	00:30	8.9	0	W	0	774.4	0
20/04/2024	01:00	8.8	0	W	0	774.4	0
20/04/2024	01:30	8.8	0	W	0	774.4	0
20/04/2024	02:00	8.9	0	W	0	774.5	0
20/04/2024	02:30	8.9	0	W	0	774.6	0
20/04/2024	03:00	9	0	W	0	774.6	0
20/04/2024	03:30	9.1	0	WNW	0	774.7	0
20/04/2024	04:00	9.2	0	WNW	0	774.7	0
20/04/2024	04:30	9.2	0	WNW	0	774.7	0
20/04/2024	05:00	9.3	0	WNW	0	774.7	0
20/04/2024	05:30	9.3	0	WNW	0	774.8	0
20/04/2024	06:00	9.4	0	WNW	0	774.8	0
20/04/2024	06:30	9.4	0	NW	0	774.8	0

Date	Time	Temp Out	Wind Speed	Wind Dir	Wind Run	Bar	Rain
19/04/2024	07:00	10	0.4	N	0.8	774.8	0
19/04/2024	07:30	10.3	0.9	NNW	1.61	775	0
19/04/2024	08:00	10.2	1.3	NW	2.41	775	0
19/04/2024	08:30	10.7	1.3	NW	2.41	775.3	0
19/04/2024	09:00	10.8	1.8	NW	3.22	775.5	0
19/04/2024	09:30	11.1	1.3	NW	2.41	775.9	0
19/04/2024	10:00	11.8	1.8	NW	3.22	776.1	0
19/04/2024	10:30	11.8	1.8	NW	3.22	776.3	0
19/04/2024	11:00	12.5	1.8	NW	3.22	776.5	0
19/04/2024	11:30	11.3	0.4	NE	0.8	777	0
19/04/2024	12:00	10.1	0.4	NE	0.8	777.2	0
19/04/2024	12:30	10.9	0.4	NNE	0.8	777.3	0
19/04/2024	13:00	11.4	0.4	NNW	0.8	777.5	0
19/04/2024	13:30	12.2	0.4	NW	0.8	777.6	0
19/04/2024	14:00	13.1	0.9	NW	1.61	777.8	0
19/04/2024	14:30	12.4	0.9	NW	1.61	777.9	0
19/04/2024	15:00	12.9	0.9	NW	1.61	777.9	0
19/04/2024	15:30	13.2	0.4	NW	0.8	778	0
19/04/2024	16:00	13.1	0.4	NW	0.8	778.4	0
19/04/2024	16:30	12.8	0.4	NW	0.8	778.6	0
19/04/2024	17:00	10.1	0.4	NW	0.8	779.2	0
19/04/2024	17:30	9.8	0	NE	0	779.4	0
19/04/2024	18:00	9.7	0	NE	0	779.7	0
19/04/2024	18:30	9.3	0	NW	0	780.1	0
19/04/2024	19:00	8.3	0	NNE	0	780.5	0
19/04/2024	19:30	6.1	0	---	0	781	0
19/04/2024	20:00	4.3	0	---	0	781.4	0
19/04/2024	20:30	3.6	0	---	0	781.3	0
19/04/2024	21:00	3.1	0	---	0	781.7	0
19/04/2024	21:30	3.3	0	---	0	781.9	0
19/04/2024	22:00	2.7	0	---	0	782.1	0
19/04/2024	22:30	2.2	0	---	0	782.6	0
19/04/2024	23:00	2.2	0	---	0	782.8	0
19/04/2024	23:30	2	0	---	0	783.1	0
20/04/2024	00:00	1.7	0	---	0	783.2	0
20/04/2024	00:30	1.7	0	---	0	783.3	0
20/04/2024	01:00	1.2	0	---	0	783.5	0
20/04/2024	01:30	0.9	0	---	0	783.7	0
20/04/2024	02:00	0.8	0	---	0	783.8	0
20/04/2024	02:30	0.1	0	---	0	783.9	0
20/04/2024	03:00	0.1	0	---	0	784.1	0
20/04/2024	03:30	-0.1	0	---	0	784.2	0
20/04/2024	04:00	-0.1	0	---	0	784.4	0
20/04/2024	04:30	-0.4	0	---	0	784.7	0
20/04/2024	05:00	-0.3	0	---	0	784.9	0
20/04/2024	05:30	0.5	0	---	0	785.2	0

Date	Time	Temp Out	Wind Speed	Wind Dir	Wind Run	Bar	Rain
20/04/2024	06:00	1.6	0	---	0	785.3	0
20/04/2024	06:30	2.9	0	---	0	785.5	0
20/04/2024	07:00	5.4	0	---	0	785.7	0
20/04/2024	07:30	6.8	0	---	0	785.7	0
20/04/2024	08:00	8.2	0	---	0	786	0
20/04/2024	08:30	9.1	0	---	0	785.6	0
20/04/2024	09:00	9.8	0	---	0	785.7	0
20/04/2024	09:30	10.2	0	WSW	0	785.8	0
20/04/2024	10:00	10.4	0	WSW	0	785.9	0
20/04/2024	10:30	10.5	0	WSW	0	785.9	0
20/04/2024	11:00	11.2	0	WSW	0	785.7	0
20/04/2024	11:30	11.6	0	W	0	785.7	0
20/04/2024	12:00	12.4	0	W	0	785.9	0
20/04/2024	12:30	12.4	0	WSW	0	786	0
20/04/2024	13:00	13.1	0	WSW	0	785.8	0
20/04/2024	13:30	13.5	0	W	0	785.6	0
20/04/2024	14:00	13.3	0	WSW	0	785.6	0
20/04/2024	14:30	13.4	0	W	0	785.4	0
20/04/2024	15:00	13.3	0	W	0	785.3	0
20/04/2024	15:30	13.3	0	WSW	0	785.3	0
20/04/2024	16:00	12.8	0	WSW	0	785.3	0
20/04/2024	16:30	12.7	0	WSW	0	785.3	0
20/04/2024	17:00	12.3	0	WSW	0	785.3	0
20/04/2024	17:30	10.9	0	WSW	0	785.2	0
20/04/2024	18:00	10.2	0	NE	0	785.2	0
20/04/2024	18:30	9.6	0	WSW	0	785.2	0
20/04/2024	19:00	8.9	0	WSW	0	785.5	0
20/04/2024	19:30	8.4	0	---	0	785.6	0
20/04/2024	20:00	8.1	0	---	0	785.6	0
20/04/2024	20:30	7.5	0	---	0	785.6	0
20/04/2024	21:00	8	0	---	0	785.8	0
20/04/2024	21:30	7.4	0	---	0	785.7	0
20/04/2024	22:00	7.5	0	---	0	785.7	0
20/04/2024	22:30	6.3	0	---	0	785.8	0
20/04/2024	23:00	5.7	0	---	0	785.8	0
20/04/2024	23:30	5.6	0	---	0	786	0
21/04/2024	00:00	6.2	0	---	0	786.4	0
21/04/2024	00:30	6.3	0	---	0	786.4	0
21/04/2024	01:00	6.2	0	---	0	786.2	0
21/04/2024	01:30	6.3	0	---	0	786.2	0
21/04/2024	02:00	6.5	0	---	0	786	0
21/04/2024	02:30	6.8	0	---	0	786.1	0
21/04/2024	03:00	6.9	0	---	0	786.2	0
21/04/2024	03:30	6.8	0	---	0	786.4	0
21/04/2024	04:00	6.8	0	---	0	786.5	0
21/04/2024	04:30	6.7	0	---	0	786.6	0

		Temp	Wind	Wind	Wind		
Date	**Time**	**Out**	**Speed**	**Dir**	**Run**	**Bar**	**Rain**
21/04/2024	05:00	6.7	0	---	0	786.8	0
21/04/2024	05:30	6.9	0	---	0	786.9	0
21/04/2024	06:00	7.2	0	---	0	787	0
21/04/2024	06:30	7.6	0	---	0	787.2	0
21/04/2024	07:00	7.8	0	---	0	787.2	0
21/04/2024	07:30	8.4	0	---	0	787.4	0
21/04/2024	08:00	9.2	0	---	0	787.3	0
21/04/2024	08:30	10.2	0	---	0	787.3	0
21/04/2024	09:00	10.7	0	NE	0	787.5	0
21/04/2024	09:30	11.2	0	N	0	787.5	0
21/04/2024	10:00	11.7	0	NE	0	787.5	0
21/04/2024	10:30	11.8	0	NE	0	787.4	0
21/04/2024	11:00	12.2	0	N	0	787.5	0
21/04/2024	11:30	12	0	NE	0	787.5	0
21/04/2024	12:00	12.5	0	NNE	0	787.3	0
21/04/2024	12:30	13.2	0	NE	0	787.3	0
21/04/2024	13:00	12.6	0	NE	0	787.3	0
21/04/2024	13:30	12.2	0	NE	0	787.3	0
21/04/2024	14:00	12.1	0	NNW	0	787.2	0
21/04/2024	14:30	11.8	0	NNW	0	787.1	0
21/04/2024	15:00	11.8	0	NNW	0	787	0
21/04/2024	15:30	11.8	0	NNW	0	787.1	0
21/04/2024	16:00	10.9	0	NE	0	787	0
21/04/2024	16:30	10.6	0	NE	0	787	0
21/04/2024	17:00	10.2	0	NNW	0	787	0
21/04/2024	17:30	10.3	0	NE	0	787	0
21/04/2024	18:00	10.1	0	NNW	0	787	0
21/04/2024	18:30	9.6	0	NNW	0	787	0
21/04/2024	19:00	9.5	0	NW	0	787.1	0
21/04/2024	19:30	9.4	0	NNE	0	787	0
21/04/2024	20:00	9.3	0	NNW	0	787.1	0
21/04/2024	20:30	9.2	0	NE	0	787	0
21/04/2024	21:00	9.1	0	NE	0	787	0
21/04/2024	21:30	9.1	0	---	0	787.1	0
21/04/2024	22:00	9.2	0	---	0	787.1	0
21/04/2024	22:30	9	0	---	0	787.1	0
21/04/2024	23:00	8.8	0	---	0	787	0
21/04/2024	23:30	8.7	0	---	0	786.8	0
22/04/2024	00:00	8.4	0	---	0	786.7	0
22/04/2024	00:30	8.3	0	---	0	786.5	0
22/04/2024	01:00	8.3	0	---	0	786.3	0
22/04/2024	01:30	8.2	0	---	0	786.3	0
22/04/2024	02:00	8.2	0	---	0	786.2	0
22/04/2024	02:30	8.2	0	---	0	786	0
22/04/2024	03:00	9.1	0	---	0	785.9	0
22/04/2024	03:30	9.1	0	---	0	785.7	0

Date	Time	Temp Out	Wind Speed	Wind Dir	Wind Run	Bar	Rain
22/04/2024	04:00	8.8	0	---	0	785.3	0
22/04/2024	04:30	8.8	0	---	0	785.2	0
22/04/2024	05:00	8.9	0	WSW	0	785.1	0
22/04/2024	05:30	9.3	0	---	0	785.1	0
22/04/2024	06:00	9.6	0	NNE	0	784.9	0
22/04/2024	06:30	10.1	0	NNE	0	784.6	0
22/04/2024	07:00	10.1	0	WSW	0	784.6	0
22/04/2024	07:30	10.2	0	NE	0	784.8	0
22/04/2024	08:00	10.3	0	NW	0	784.5	0
22/04/2024	08:30	10.9	0	WSW	0	784.3	0
22/04/2024	09:00	10.9	0	NW	0	784.2	0
22/04/2024	09:30	11.7	0	WSW	0	784.2	0
22/04/2024	10:00	11.9	0	NE	0	783.9	0
22/04/2024	10:30	12.4	0	NE	0	783.8	0
22/04/2024	11:00	13.4	0	W	0	783.6	0
22/04/2024	11:30	12.9	0	W	0	783.6	0
22/04/2024	12:00	12.8	0	WSW	0	783.5	0
22/04/2024	12:30	14.4	0	W	0	782.7	0
22/04/2024	13:00	14.7	0	---	0	772.4	0
22/04/2024	13:30	14.7	0	SSW	0	773.5	0
22/04/2024	14:00	15.6	0	---	0	773.4	0
22/04/2024	14:30	17	0	---	0	770.2	0
22/04/2024	15:00	18.3	0	---	0	778.3	0
22/04/2024	15:30	18.7	0	---	0	772.7	0
22/04/2024	16:00	18.5	0	---	0	770.1	0
22/04/2024	16:30	17.3	0	SSW	0	769.8	0
22/04/2024	17:00	10.2	0	---	0	769.6	0
22/04/2024	17:30	8.3	0	---	0	769.7	0

Appendix 7.3 –

Baseline Sound Survey Results

Summary of LA90 levels at Baseline Monitoring Positions

	Daytime Posn A	Night-time Posn A	Daytime Posn B	Night-time Posn B	Daytime Posn C	Night-time Posn C
Total number of values	213	64	210	64	229	96
Number of excluded value	0	0	0	0	0	0
Number of binned values	213	64	210	64	229	96
Minimum	34	32	37	35	33	35
25% Percentile	39	37.25	43	41.25	42	41
Median	42	40	46	44	45	45
75% Percentile	44	42.75	47	46.75	47.5	49
Maximum	56	50	53	51	52	54
Most commonplace	**42**	**40**	**46**	**44**	46	47
Average	45.00	42.00	46.00	45.00	44.68	45.15
Std. Deviation	4.26	4.10	3.21	4.13	4.41	4.85
Std. Error of Mean	0.29	0.51	0.22	0.52	0.29	0.49
Lower 95% CI of mean	42.05	38.90	44.64	42.30	44.11	44.16
Upper 95% CI of mean	43.20	40.95	45.52	44.36	45.26	46.13

Noise Survey Results

Date: Friday 19th April 2024 **TABLE 1**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:15	15:00	57.9	60.3	50.3	80.0	Noise climate generally formed by
07:30	15:00	57.3	59.8	51.2	77.9	local road traffic and Business Park activities
07:45	15:00	54.8	57.4	50.4	76.4	
08:00	15:00	57.4	60.2	51.8	72.4	
08:15	15:00	58.5	62.0	52.0	74.1	
08:30	15:00	58.2	61.4	52.5	69.2	
08:45	15:00	57.8	60.9	51.6	65.9	
09:00	15:00	59.0	62.3	52.7	71.4	
09:15	15:00	61.3	64.1	55.5	73.0	
09:30	15:00	57.3	60.3	52.2	69.6	
09:45	15:00	58.2	60.6	51.3	80.8	
10:00	15:00	59.5	62.7	53.2	72.1	
10:15	15:00	59.8	62.5	53.7	75.0	
10:30	15:00	57.8	60.7	51.8	75.3	
10:45	15:00	60.2	63.1	54.7	76.1	
11:00	15:00	59.4	62.0	55.1	66.5	
11:15	15:00	58.7	62.0	52.0	75.6	
11:30	15:00	57.2	60.6	49.0	69.2	
11:45	15:00	59.3	58.9	44.3	78.9	
12:00	15:00	54.0	56.8	45.4	72.6	
12:15	15:00	60.9	56.7	48.0	81.0	
12:30	15:00	52.2	53.0	45.3	75.9	
12:45	15:00	55.5	59.5	46.5	75.0	
13:00	15:00	52.6	56.2	43.7	72.5	
13:15	15:00	53.3	56.8	45.7	68.4	
13:30	15:00	50.2	52.8	46.3	60.0	
13:45	15:00	53.0	55.0	48.9	65.9	
14:00	15:00	55.1	57.3	50.3	73.4	
14:15	15:00	53.1	55.8	48.2	61.7	
14:30	15:00	54.2	57.8	47.7	65.8	
14:45	15:00	54.8	56.7	50.0	75.0	
Average 0715-1500		57.5	60.0	51.0	60-81	

Noise Survey Results

Date: Friday 19th April 2024 **TABLE 2**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	55.8	58.3	50.8	73.1	
15:15	15:00	55.1	56.9	52.8	63.6	
15:30	15:00	52.3	54.9	46.5	68.6	
15:45	15:00	53.0	55.8	47.7	78.4	
16:00	15:00	50.2	52.6	46.2	63.5	
16:15	15:00	50.1	53.0	45.1	63.5	
16:30	15:00	53.1	55.0	45.9	77.3	
16:45	15:00	51.5	53.6	46.0	71.4	
17:00	15:00	52.3	49.9	45.1	75.1	
17:15	15:00	53.3	53.4	45.5	75.3	
17:30	15:00	54.3	54.2	44.0	76.7	
17:45	15:00	51.0	50.8	44.1	75.3	
18:00	15:00	48.2	51.2	44.4	60.5	
18:15	15:00	51.0	49.4	43.6	75.4	
18:30	15:00	47.7	48.0	44.3	65.4	
18:45	15:00	54.2	53.2	43.6	76.0	
19:00	15:00	47.7	49.3	41.9	67.8	
19:15	15:00	45.8	48.5	42.2	60.8	
19:30	15:00	49.3	51.7	40.9	71.7	
19:45	15:00	51.2	54.0	40.3	75.1	
20:00	15:00	44.6	46.1	38.6	61.8	
20:15	15:00	41.8	42.9	40.3	48.5	
20:30	15:00	40.2	41.8	37.7	50.1	
20:45	15:00	40.9	42.2	39.1	48.5	
21:00	15:00	42.2	43.0	40.5	52.7	
21:15	15:00	40.9	41.8	39.7	50.2	
21:30	15:00	42.0	43.0	40.6	46.9	
21:45	15:00	37.5	38.7	36.4	47.6	
22:00	15:00	39.3	41.1	36.4	47.7	
22:15	15:00	39.7	41.9	36.9	48.0	
22:30	15:00	40.3	41.5	37.5	50.9	
22:45	15:00	39.9	41.4	38.4	44.8	
Average 1500-2300		50.2	51.7	44.6	45-78	

Noise Survey Results

Date: Friday 19th -Saturday 20th April 2024 **TABLE 3**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	40.0	40.9	38.7	43.1	
23:15	15:00	40.8	41.7	37.0	53.4	
23:30	15:00	40.3	42.2	37.6	46.5	
23:45	15:00	42.0	42.8	41.0	44.6	
00:00	15:00	44.5	42.8	39.2	59.9	
00:15	15:00	53.2	56.3	49.9	60.6	
00:30	15:00	52.4	47.7	40.4	73.5	
00:45	15:00	40.5	42.9	38.6	46.0	
01:00	15:00	40.8	41.3	40.0	45.0	
01:15	15:00	39.1	40.6	37.6	44.0	
01:30	15:00	40.8	42.6	38.0	47.2	
01:45	15:00	40.8	41.7	39.4	53.2	
02:00	15:00	41.4	42.2	40.5	54.2	
02:15	15:00	42.4	43.2	41.5	44.4	
02:30	15:00	43.2	43.8	42.1	49.0	
02:45	15:00	41.9	42.9	40.7	44.3	
03:00	15:00	41.0	43.1	37.9	47.2	
03:15	15:00	40.6	41.6	38.6	43.9	
03:30	15:00	42.5	41.8	39.0	58.9	
03:45	15:00	41.5	43.4	38.0	54.2	
04:00	15:00	48.6	51.6	42.5	62.7	
04:15	15:00	54.4	57.4	45.4	71.5	
04:30	15:00	53.2	55.9	43.9	71.0	
04:45	15:00	56.4	60.9	41.8	72.7	
05:00	15:00	54.7	56.0	41.4	75.8	
05:15	15:00	47.2	50.2	40.2	65.5	
05:30	15:00	50.1	54.2	41.7	66.3	
05:45	15:00	48.2	48.4	39.9	73.2	
06:00	15:00	48.9	52.2	40.6	63.3	
06:15	15:00	47.1	50.8	39.9	58.8	
06:30	15:00	45.7	48.8	39.9	63.3	
06:45	15:00	50.2	50.6	39.6	79.7	
Average 2300-0700		48.7	51.4	41.4	43-80	
Average 0700-2300		55.2	57.6	48.9	45-81	

Noise Survey Results

Date: Saturday 20th April 2024 **TABLE 4**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	52.0	54.3	39.0	72.4	
07:15	15:00	45.2	48.1	41.5	65.5	
07:30	15:00	48.4	51.5	41.7	70.0	
07:45	15:00	49.5	50.4	42.2	71.6	
08:00	15:00	49.0	50.5	41.6	71.0	
08:15	15:00	51.8	55.9	38.6	67.9	
08:30	15:00	48.2	52.9	38.2	66.5	
08:45	15:00	46.5	50.3	37.4	69.4	
09:00	15:00	44.7	47.8	37.4	66.4	
09:15	15:00	49.8	52.1	39.1	67.0	
09:30	15:00	45.0	48.3	38.5	60.8	
09:45	15:00	44.9	48.3	39.4	57.7	
10:00	15:00	51.3	53.7	38.7	73.6	
10:15	15:00	48.0	51.3	38.9	66.0	
10:30	15:00	49.1	53.2	38.5	68.3	
10:45	15:00	45.8	48.8	38.8	62.9	
11:00	15:00	47.7	49.6	38.4	65.2	
11:15	15:00	46.9	48.9	38.9	66.6	
11:30	15:00	46.0	49.1	38.5	60.2	
11:45	15:00	43.4	46.2	38.2	62.1	
12:00	15:00	51.5	50.0	39.1	71.8	
12:15	15:00	46.1	47.0	38.5	68.4	
12:30	15:00	41.7	42.7	37.3	66.2	
12:45	15:00	44.5	47.7	37.8	61.7	
13:00	15:00	45.5	46.0	37.5	64.0	
13:15	15:00	49.6	54.2	38.7	66.5	
13:30	15:00	49.3	51.5	38.3	66.5	
13:45	15:00	45.4	46.2	38.3	74.1	
14:00	15:00	41.8	44.1	38.5	52.3	
14:15	15:00	51.0	45.4	38.5	73.7	
14:30	15:00	50.8	55.1	39.3	67.0	
14:45	15:00	47.9	49.8	39.3	69.7	
Average 0700-1500		48.2	49.7	38.9	52-74	

Noise Survey Results

Date: Saturday 20th April 2024 **TABLE 5**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	44.8	46.8	39.2	66.3	
15:15	15:00	42.3	44.8	38.1	59.9	
15:30	15:00	45.2	48.1	39.4	60.2	
15:45	15:00	46.3	48.3	38.5	69.4	
16:00	15:00	48.5	50.6	40.5	79.1	
16:15	15:00	45.5	46.7	40.5	63.1	
16:30	15:00	46.7	49.7	41.0	66.4	
16:45	15:00	46.4	48.3	40.9	64.8	
17:00	15:00	53.4	47.0	40.6	74.8	
17:15	15:00	43.7	44.3	40.0	59.7	
17:30	15:00	49.0	46.5	40.5	82.4	
17:45	15:00	45.7	48.0	41.4	67.6	
18:00	15:00	45.9	49.1	41.6	57.5	
18:15	15:00	45.6	46.1	42.1	69.3	
18:30	15:00	52.4	47.3	41.9	76.1	
18:45	15:00	51.4	55.1	42.7	72.8	
19:00	15:00	48.5	50.0	42.9	66.2	
19:15	15:00	49.2	48.6	42.4	79.0	
19:30	15:00	49.0	49.1	42.2	68.6	
19:45	15:00	47.8	47.8	42.5	67.9	
20:00	15:00	47.5	46.9	43.7	67.9	
20:15	15:00	44.6	45.1	43.6	57.3	
20:30	15:00	42.4	43.3	41.3	52.3	
20:45	15:00	44.0	45.0	42.3	57.2	
21:00	15:00	43.0	43.8	42.0	52.4	
21:15	15:00	45.2	45.6	43.7	60.3	
21:30	15:00	45.3	46.0	44.3	48.6	
21:45	15:00	45.3	46.1	44.1	49.8	
22:00	15:00	45.8	46.3	45.0	47.7	
22:15	15:00	46.7	47.3	45.9	49.3	
22:30	15:00	46.3	47.0	45.3	54.8	
22:45	15:00	43.9	46.1	34.3	47.7	
Average 1500-2300		47.4	47.9	42.2	48-82	

Noise Survey Results

Date: Saturday 20th - Sunday 21st April 2024 **TABLE 6**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	37.0	34.9	33.9	40.5	IBA Not Operatiing during this period
23:15	15:00	37.3	38.8	33.8	53.1	IBA Not Operatiing during this period
23:30	15:00	36.1	36.6	35.4	39.4	IBA Not Operatiing during this period
23:45	15:00	35.7	36.8	34.5	48.9	IBA Not Operatiing during this period
00:00	15:00	35.0	35.5	34.3	43.4	IBA Not Operatiing during this period
00:15	15:00	37.9	39.0	35.7	45.8	IBA Not Operatiing during this period
00:30	15:00	39.7	41.6	36.3	58.5	IBA Not Operatiing during this period
00:45	15:00	35.7	36.6	34.7	42.4	IBA Not Operatiing during this period
01:00	15:00	35.8	36.9	34.7	42.3	IBA Not Operatiing during this period
01:15	15:00	35.5	36.0	34.8	45.9	IBA Not Operatiing during this period
01:30	15:00	35.2	35.8	34.3	41.7	IBA Not Operatiing during this period
01:45	15:00	37.2	38.3	35.8	40.9	IBA Not Operatiing during this period
02:00	15:00	36.9	37.7	35.8	40.6	IBA Not Operatiing during this period
02:15	15:00	36.8	39.0	33.7	51.7	IBA Not Operatiing during this period
02:30	15:00	34.0	34.6	33.2	38.0	IBA Not Operatiing during this period
02:45	15:00	38.1	39.8	33.7	53.4	IBA Not Operatiing during this period
03:00	15:00	37.3	39.5	33.6	53.0	IBA Not Operatiing during this period
03:15	15:00	35.8	37.0	33.8	48.8	IBA Not Operatiing during this period
03:30	15:00	36.3	35.5	33.6	50.3	IBA Not Operatiing during this period
03:45	15:00	42.2	43.9	35.2	60.9	IBA Not Operatiing during this period
04:00	15:00	50.2	53.5	40.0	66.0	IBA Not Operatiing during this period
04:15	15:00	54.1	57.6	44.8	71.7	IBA Not Operatiing during this period
04:30	15:00	56.6	58.9	44.1	76.1	IBA Not Operatiing during this period
04:45	15:00	49.7	52.5	41.3	69.0	IBA Not Operatiing during this period
05:00	15:00	53.9	55.0	39.4	70.4	IBA Not Operatiing during this period
05:15	15:00	47.1	50.5	38.9	65.4	IBA Not Operatiing during this period
05:30	15:00	48.9	50.5	38.4	73.9	IBA Not Operatiing during this period
05:45	15:00	49.1	51.0	38.5	68.0	IBA Not Operatiing during this period
06:00	15:00	51.1	51.5	37.5	74.2	IBA Not Operatiing during this period
06:15	15:00	42.6	45.4	37.5	58.6	IBA Not Operatiing during this period
06:30	15:00	52.7	49.2	37.9	74.3	IBA Not Operatiing during this period
06:45	15:00	45.6	48.3	37.8	64.4	IBA Not Operatiing during this period
Average 2300-0700		47.6	49.5	37.7	38-76	
Average 0700-2300		47.8	49.6	40.9	48-82	

Noise Survey Results

Date: Sunday 21st April 2024 **TABLE 7**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	45.2	48.0	37.8	59.7	
07:15	15:00	54.9	54.6	39.1	75.5	
07:30	15:00	50.9	45.9	37.2	74.7	
07:45	15:00	43.2	46.4	36.5	65.8	
08:00	15:00	48.2	51.3	36.7	69.2	
08:15	15:00	49.3	53.4	38.1	63.0	
08:30	15:00	48.8	51.7	38.5	66.9	
08:45	15:00	46.3	49.2	38.5	64.0	
09:00	15:00	54.1	58.1	39.4	71.9	
09:15	15:00	48.9	49.9	39.2	66.1	
09:30	15:00	45.8	49.0	40.1	57.9	
09:45	15:00	45.2	48.5	39.3	57.9	
10:00	15:00	47.4	50.0	38.8	67.9	
10:15	15:00	55.5	57.3	38.1	72.9	
10:30	15:00	48.8	52.1	38.4	66.7	
10:45	15:00	45.9	49.2	38.6	62.0	
11:00	15:00	51.9	54.6	37.8	70.8	
11:15	15:00	52.4	53.6	38.1	70.9	
11:30	15:00	47.1	49.2	38.5	66.6	
11:45	15:00	44.8	46.9	38.8	60.7	
12:00	15:00	49.0	51.3	38.5	67.7	
12:15	15:00	48.3	51.4	39.6	66.4	
12:30	15:00	48.0	51.2	38.8	66.8	
12:45	15:00	47.2	50.7	39.1	65.4	
13:00	15:00	42.0	44.4	38.8	53.5	
13:15	15:00	45.7	48.8	39.5	60.2	
13:30	15:00	47.6	50.3	42.4	63.8	
13:45	15:00	45.0	47.0	42.2	55.7	
14:00	15:00	46.6	49.2	43.6	62.2	
14:15	15:00	46.6	48.2	43.8	62.7	
14:30	15:00	45.1	46.4	42.3	59.6	
14:45	15:00	48.2	48.5	43.6	70.5	
Average 0700-1500		49.2	51.4	39.8	54-76	

Noise Survey Results

Date: Sunday 21st April 2024 **TABLE 8**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	48.3	47.8	43.3	69.2	
15:15	15:00	47.2	50.0	43.2	59.2	
15:30	15:00	45.3	46.6	42.2	61.5	
15:45	15:00	48.3	50.5	43.5	66.2	
16:00	15:00	46.5	48.2	43.8	61.5	
16:15	15:00	46.9	48.3	44.0	64.0	
16:30	15:00	47.5	49.6	44.0	64.6	
16:45	15:00	47.3	48.5	43.6	63.3	
17:00	15:00	46.2	47.8	44.0	54.4	
17:15	15:00	46.7	48.2	44.3	58.5	
17:30	15:00	46.3	47.7	43.7	64.6	
17:45	15:00	45.2	46.9	43.1	53.3	
18:00	15:00	46.5	48.0	43.9	59.6	
18:15	15:00	45.9	47.7	43.6	56.5	
18:30	15:00	46.4	47.6	44.2	63.6	
18:45	15:00	54.0	49.8	44.4	76.8	
19:00	15:00	47.4	49.0	44.4	63.6	
19:15	15:00	46.0	47.2	43.5	65.4	
19:30	15:00	51.5	54.6	43.8	68.9	
19:45	15:00	46.3	47.9	43.2	60.0	
20:00	15:00	44.8	46.1	42.8	58.1	
20:15	15:00	44.8	46.1	43.0	56.0	
20:30	15:00	45.0	46.1	43.6	55.9	
20:45	15:00	45.9	47.4	43.6	63.2	
21:00	15:00	44.5	45.7	42.9	54.1	
21:15	15:00	43.4	44.3	42.3	53.2	
21:30	15:00	41.5	42.7	39.8	44.7	
21:45	15:00	40.8	41.6	39.9	45.1	
22:00	15:00	41.2	42.4	39.6	45.1	
22:15	15:00	41.4	42.4	40.4	44.6	
22:30	15:00	40.6	41.4	39.8	44.2	
22:45	15:00	40.4	41.7	38.2	45.5	
Average 1500-2300		46.7	47.8	43.0	44-77	

Noise Survey Results

Date: Sunday 21st - Monday 22nd April 2024 **TABLE 9**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	37.9	38.9	36.3	56.7	
23:15	15:00	39.7	40.8	37.1	48.8	
23:30	15:00	38.5	39.7	37.1	44.3	
23:45	15:00	36.4	37.5	34.7	43.8	
00:00	15:00	33.8	34.3	33.0	36.7	
00:15	15:00	33.7	34.5	32.4	40.0	
00:30	15:00	33.3	33.9	32.7	36.8	
00:45	15:00	33.1	33.5	32.3	50.9	
01:00	15:00	33.3	33.8	32.6	44.0	
01:15	15:00	34.0	34.4	33.1	50.8	
01:30	15:00	34.1	34.6	33.3	46.7	
01:45	15:00	34.0	34.6	33.0	43.7	
02:00	15:00	35.2	36.0	33.8	39.5	
02:15	15:00	37.7	37.5	35.8	52.8	
02:30	15:00	38.6	39.2	37.4	49.8	
02:45	15:00	42.5	44.5	39.6	51.4	
03:00	15:00	42.3	43.3	41.1	52.7	
03:15	15:00	42.6	43.4	41.4	49.3	
03:30	15:00	41.8	42.8	40.7	45.8	
03:45	15:00	46.0	45.3	42.1	66.8	
04:00	15:00	51.4	54.1	44.0	67.4	
04:15	15:00	50.6	52.8	46.3	63.0	
04:30	15:00	50.9	53.0	45.4	64.1	
04:45	15:00	51.1	53.0	44.8	65.9	
05:00	15:00	50.9	51.1	45.0	66.7	
05:15	15:00	49.3	52.7	44.4	65.7	
05:30	15:00	55.2	56.3	45.4	73.7	
05:45	15:00	52.5	55.5	44.9	69.9	
06:00	15:00	55.4	56.7	44.7	82.4	
06:15	15:00	57.4	56.2	45.5	78.4	
06:30	15:00	55.5	58.2	45.2	73.3	
06:45	15:00	51.9	55.6	44.5	72.0	
Average 2300-0700		49.4	51.0	41.8	37-82	
Average 0700-2300		48.1	50.0	41.7	44-77	

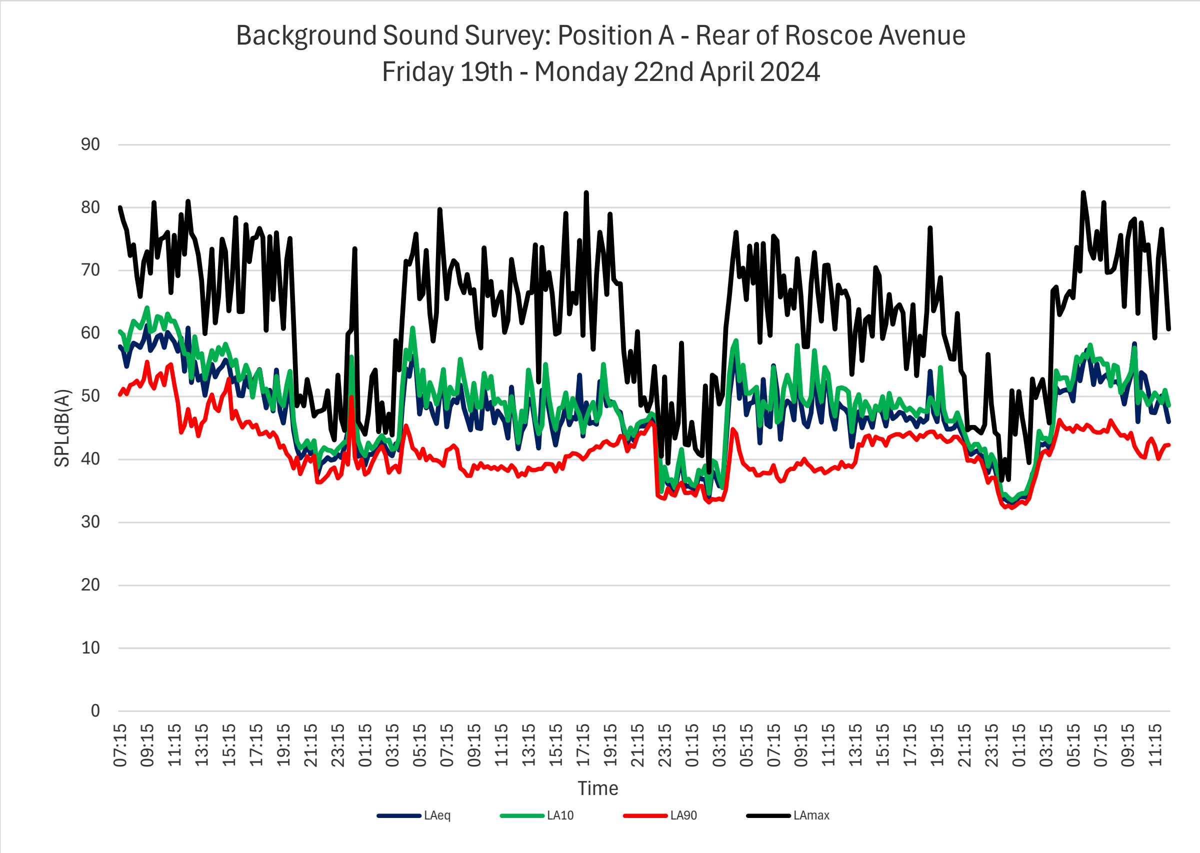
Noise Survey Results

Date: Monday 22nd April 2024 **TABLE 10**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position A - Rear of Roscoe Avenue**
Instrumentation: Cirrus 171A Real Time Analyser (G061253)
Calibration: 94dB

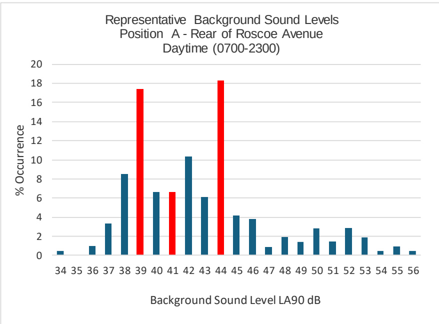
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	55.2	55.9	44.3	76.2	
07:15	15:00	52.3	56.0	44.3	71.8	
07:30	15:00	53.1	55.1	44.7	80.8	
07:45	15:00	53.5	55.2	44.4	69.7	
08:00	15:00	52.2	51.7	46.2	69.8	
08:15	15:00	52.3	55.0	45.3	70.3	
08:30	15:00	52.4	54.7	44.5	72.6	
08:45	15:00	51.5	50.6	43.8	75.6	
09:00	15:00	48.8	51.9	43.9	64.3	
09:15	15:00	51.4	52.7	43.3	74.9	
09:30	15:00	53.3	53.9	44.2	77.6	
09:45	15:00	58.4	57.7	42.1	78.2	
10:00	15:00	46.0	49.0	41.2	63.2	
10:15	15:00	53.8	50.7	40.5	77.6	
10:30	15:00	53.3	50.0	40.3	73.2	
10:45	15:00	51.1	48.7	42.6	74.1	
11:00	15:00	47.5	49.5	43.3	67.2	
11:15	15:00	47.4	50.6	42.2	59.3	
11:30	15:00	49.2	49.8	40.1	72.0	
11:45	15:00	50.1	49.0	41.3	76.6	
12:00	15:00	48.7	51.0	42.2	69.7	
12:15	15:00	46.0	48.6	42.3	60.7	
Average 0700-1230		52.2	53.0	43.3	59-81	

Overall Average	**49.1**	**51.2**	**41.6**	**37-82**	
Overall Average	**51.8**	**53.9**	**45.2**	**44-82**	

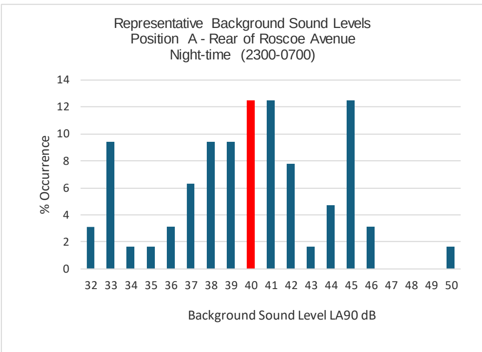
Average 0600-0700	**53.2**	**54.7**	**43.1**	**59-82**



LA90	% Occurrence
34	0.5
35	0
36	0.9
37	3.3
38	8.5
39	17.4
40	6.6
41	6.6
42	10.3
43	6.1
44	18.3
45	4.2
46	3.8
47	0.9
48	1.9
49	1.4
50	2.8
51	1.4
52	2.8
53	1.9
54	0.5
55	0.9
56	0.5



LA90	% Occurrence
32	3.1
33	9.4
34	1.6
35	1.6
36	3.1
37	6.3
38	9.4
39	9.4
40	12.5
41	12.5
42	7.8
43	1.6
44	4.7
45	12.5
46	3.1
47	0.0
48	0.0
49	0
50	1.6



Noise Survey Results

Date: Friday 19th April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 11**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
08:00	15:00	53.6	56.0	50.8	62.3	Noise climate generally formed by Busineess Park activities, distant road traffic noise and birdsong
08:15	15:00	54.1	56.0	51.6	68.8	
08:30	15:00	54.8	56.3	51.5	72.3	
08:45	15:00	54.5	56.9	51.3	62.6	
09:00	15:00	55.8	58.0	52.0	68.1	
09:15	15:00	55.1	57.0	52.6	61.5	
09:30	15:00	55.0	56.9	52.2	67.9	
09:45	15:00	55.5	57.7	52.3	69.4	
10:00	15:00	54.7	56.7	52.0	65.6	
10:15	15:00	55.4	57.2	52.8	68.7	
10:30	15:00	54.2	56.6	51.0	65.7	
10:45	15:00	54.5	56.5	50.7	67.1	
11:00	15:00	53.7	55.7	51.0	59.8	
11:15	15:00	55.2	57.1	52.0	67.5	
11:30	15:00	54.8	56.8	51.4	68.6	
11:45	15:00	51.6	53.6	46.2	73.4	
12:00	15:00	52.5	53.9	47.1	69.9	
12:15	15:00	56.0	55.4	49.4	77.0	
12:30	15:00	50.0	52.3	46.1	62.8	
12:45	15:00	50.4	52.3	47.6	59.8	
13:00	15:00	50.0	52.1	47.1	58.2	
13:15	15:00	51.0	53.3	47.9	57.6	
13:30	15:00	51.4	53.5	47.5	66.5	
13:45	15:00	52.8	54.6	49.8	69.3	
14:00	15:00	51.8	53.6	48.9	63.0	
14:15	15:00	52.4	54.0	48.4	65.4	
14:30	15:00	51.9	54.2	48.9	60.8	
14:45	15:00	51.5	53.2	48.8	63.8	
Average 0800-1500		53.7	55.6	50.4	58-77	

Noise Survey Results

Date: Friday 19th April 2024 **TABLE 12**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	51.7	53.5	48.8	64.3	
15:15	15:00	51.1	53.2	48.2	62.6	
15:30	15:00	50.3	52.6	47.2	62.7	
15:45	15:00	50.4	52.0	47.4	62.8	
16:00	15:00	50.1	52.4	46.9	59.5	
16:15	15:00	51.9	53.8	47.8	66.2	
16:30	15:00	50.0	52.1	46.0	61.4	
16:45	15:00	48.5	50.5	45.8	56.9	
17:00	15:00	48.4	50.5	45.7	56.4	
17:15	15:00	49.5	51.5	46.5	59.7	
17:30	15:00	51.6	53.2	45.0	69.6	
17:45	15:00	49.1	51.0	46.3	60.0	
18:00	15:00	51.8	52.1	46.8	73.4	
18:15	15:00	51.7	54.5	47.0	63.8	
18:30	15:00	50.8	53.0	47.8	59.6	
18:45	15:00	50.7	52.6	47.6	65.0	
19:00	15:00	49.8	52.5	45.2	63.9	
19:15	15:00	47.4	50.0	42.9	57.7	
19:30	15:00	46.2	48.8	39.7	61.3	
19:45	15:00	45.5	48.9	39.7	61.0	
20:00	15:00	47.0	45.8	38.0	69.7	
20:15	15:00	42.3	42.5	38.8	61.2	
20:30	15:00	42.0	42.4	38.9	57.6	
20:45	15:00	40.2	41.4	38.3	54.0	
21:00	15:00	42.5	42.7	40.0	59.6	
21:15	15:00	41.5	42.6	40.2	46.0	
21:30	15:00	43.0	44.5	41.2	48.1	
21:45	15:00	43.2	44.5	41.7	47.9	
22:00	15:00	41.6	43.2	39.1	45.4	
22:15	15:00	42.0	43.5	39.1	45.5	
22:30	15:00	41.3	43.0	39.3	47.1	
22:45	15:00	41.5	43.1	39.8	46.9	
Average 1500-2300		48.5	50.4	44.9	45-73	

Noise Survey Results

Date: Friday 19th -Saturday 20th April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 13**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	44.2	46.2	41.5	49.6	
23:15	15:00	45.0	46.1	43.9	49.1	
23:30	15:00	45.2	46.4	43.5	48.2	
23:45	15:00	46.4	47.4	44.7	49.2	
00:00	15:00	46.8	48.3	43.7	50.7	
00:15	15:00	46.8	48.4	44.7	50.0	
00:30	15:00	45.4	47.0	43.5	49.1	
00:45	15:00	46.2	47.5	44.1	51.2	
01:00	15:00	46.3	47.7	44.5	49.2	
01:15	15:00	44.7	46.0	42.8	47.7	
01:30	15:00	44.0	45.7	41.9	47.6	
01:45	15:00	45.5	46.7	44.1	51.3	
02:00	15:00	46.0	48.1	43.8	50.8	
02:15	15:00	47.6	48.6	45.1	50.5	
02:30	15:00	48.0	48.9	46.5	50.5	
02:45	15:00	48.7	49.9	47.0	51.6	
03:00	15:00	46.7	49.0	44.0	51.6	
03:15	15:00	44.0	44.9	42.7	47.3	
03:30	15:00	41.0	42.6	39.7	45.0	
03:45	15:00	46.7	49.2	37.8	62.3	
04:00	15:00	59.0	62.0	46.9	76.7	
04:15	15:00	60.3	64.4	49.1	75.6	
04:30	15:00	51.4	53.5	44.8	71.9	
04:45	15:00	53.3	57.0	44.6	69.7	
05:00	15:00	47.5	50.3	42.6	60.8	
05:15	15:00	47.7	49.6	43.7	65.1	
05:30	15:00	45.9	48.0	42.3	63.6	
05:45	15:00	45.8	48.3	42.5	57.6	
06:00	15:00	48.9	49.1	41.3	70.3	
06:15	15:00	45.5	47.9	41.4	57.9	
06:30	15:00	46.3	47.2	41.8	65.2	
06:45	15:00	52.1	55.5	44.3	69.5	
Average 2300-0700		50.4	53.4	44.1	50-77	
Average 0700-2300		51.8	53.7	48.4	45-77	

Noise Survey Results

Date: Saturday 20th April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 14**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	45.8	48.2	41.7	61.7	
07:15	15:00	49.8	49.7	41.6	70.3	
07:30	15:00	46.0	47.5	41.1	64.4	
07:45	15:00	44.1	46.2	41.1	60.5	
08:00	15:00	46.4	48.4	41.9	61.6	
08:15	15:00	44.5	46.6	41.2	62.2	
08:30	15:00	48.1	49.9	41.9	69.6	
08:45	15:00	46.0	47.5	41.6	64.4	
09:00	15:00	44.6	46.0	41.4	63.3	
09:15	15:00	48.1	50.1	42.5	69.1	
09:30	15:00	45.8	48.4	41.6	59.3	
09:45	15:00	46.1	47.6	41.9	60.7	
10:00	15:00	47.3	49.2	43.8	63.7	
10:15	15:00	47.5	48.6	43.0	68.6	
10:30	15:00	47.3	49.5	42.3	62.8	
10:45	15:00	46.9	49.6	43.1	59.6	
11:00	15:00	48.0	51.2	42.2	61.9	
11:15	15:00	46.0	48.3	42.1	58.4	
11:30	15:00	48.3	50.7	43.4	64.7	
11:45	15:00	47.1	47.6	42.4	68.8	
12:00	15:00	47.1	49.6	42.7	69.9	
12:15	15:00	47.5	49.6	42.5	61.8	
12:30	15:00	48.0	48.4	42.5	65.7	
12:45	15:00	48.4	51.0	43.6	62.4	
13:00	15:00	46.7	48.6	43.8	60.7	
13:15	15:00	46.7	48.8	43.7	57.9	
13:30	15:00	47.4	48.4	43.5	69.6	
13:45	15:00	47.0	48.8	43.8	64.9	
14:00	15:00	46.4	48.4	43.5	55.8	
14:15	15:00	47.5	49.3	44.3	59.1	
14:30	15:00	47.5	49.3	44.5	58.6	
14:45	15:00	47.6	49.6	44.5	55.5	
Average 0700-1500		47.0	48.9	42.7	56-70	

Noise Survey Results

Date: Saturday 20th April 2024 **TABLE 15**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	48.1	49.8	45.0	56.9	
15:15	15:00	47.2	49.0	44.5	57.6	
15:30	15:00	47.5	49.6	44.2	55.8	
15:45	15:00	52.9	54.0	44.8	71.8	
16:00	15:00	49.6	51.8	45.5	66.9	
16:15	15:00	51.4	53.8	46.2	70.3	
16:30	15:00	49.1	51.4	45.4	59.6	
16:45	15:00	48.9	51.4	44.9	59.1	
17:00	15:00	51.0	52.9	46.1	67.6	
17:15	15:00	48.9	51.1	45.4	63.7	
17:30	15:00	48.3	50.6	44.5	61.6	
17:45	15:00	52.1	52.1	44.5	66.2	
18:00	15:00	49.2	50.3	44.9	63.6	
18:15	15:00	48.8	51.4	45.4	58.9	
18:30	15:00	48.9	51.0	45.7	62.9	
18:45	15:00	49.6	51.7	46.0	65.1	
19:00	15:00	49.3	51.2	45.4	63.2	
19:15	15:00	49.3	51.0	46.7	61.1	
19:30	15:00	51.0	51.7	46.7	68.4	
19:45	15:00	52.1	54.6	46.2	67.8	
20:00	15:00	51.8	54.6	47.4	68.2	
20:15	15:00	49.2	50.9	46.8	55.5	
20:30	15:00	49.9	50.8	48.0	71.6	
20:45	15:00	50.0	51.3	48.1	57.8	
21:00	15:00	50.3	51.6	48.7	54.1	
21:15	15:00	51.2	52.7	49.4	55.4	
21:30	15:00	50.5	52.0	48.3	57.6	
21:45	15:00	49.0	50.4	47.2	53.1	
22:00	15:00	48.8	50.1	47.1	52.9	
22:15	15:00	50.2	51.7	48.3	54.9	
22:30	15:00	50.3	52.5	47.1	58.3	
22:45	15:00	47.1	49.7	36.6	54.4	
Average 1500-2300		49.9	51.7	46.3	53-72	

Noise Survey Results

Date: Saturday 20th - Sunday 21st April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 16**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	**Run Time (mins.)**	**LAeq (dB)**	**LA10 (dB)**	**LA90 (dB)**	**LAmax (dB)**	**Observations**
23:00	15:00	36.1	37.2	34.7	47.5	IBA Not Operatiing during this period
23:15	15:00	37.3	38.7	35.1	47.2	IBA Not Operatiing during this period
23:30	15:00	41.0	42.2	38.7	46.1	IBA Not Operatiing during this period
23:45	15:00	40.8	41.8	39.6	44.3	IBA Not Operatiing during this period
00:00	15:00	39.5	40.6	38.1	44.2	IBA Not Operatiing during this period
00:15	15:00	43.2	45.1	40.0	47.1	IBA Not Operatiing during this period
00:30	15:00	41.9	43.6	38.3	53.1	IBA Not Operatiing during this period
00:45	15:00	38.3	39.7	36.5	52.6	IBA Not Operatiing during this period
01:00	15:00	38.6	39.8	37.3	45.2	IBA Not Operatiing during this period
01:15	15:00	39.6	40.8	38.0	49.6	IBA Not Operatiing during this period
01:30	15:00	39.5	40.9	37.7	49.0	IBA Not Operatiing during this period
01:45	15:00	39.3	40.5	37.6	44.0	IBA Not Operatiing during this period
02:00	15:00	39.5	40.6	38.1	43.8	IBA Not Operatiing during this period
02:15	15:00	39.2	40.7	36.7	57.1	IBA Not Operatiing during this period
02:30	15:00	37.7	39.1	36.2	43.8	IBA Not Operatiing during this period
02:45	15:00	39.7	41.4	36.0	56.1	IBA Not Operatiing during this period
03:00	15:00	39.2	41.1	35.6	54.2	IBA Not Operatiing during this period
03:15	15:00	44.6	47.2	35.6	62.5	IBA Not Operatiing during this period
03:30	15:00	46.9	51.5	35.8	64.2	IBA Not Operatiing during this period
03:45	15:00	52.1	56.8	37.2	65.2	IBA Not Operatiing during this period
04:00	15:00	55.7	59.2	46.0	70.4	IBA Not Operatiing during this period
04:15	15:00	60.7	64.6	50.1	77.2	IBA Not Operatiing during this period
04:30	15:00	56.0	60.1	46.1	70.0	IBA Not Operatiing during this period
04:45	15:00	54.6	55.2	42.4	77.2	IBA Not Operatiing during this period
05:00	15:00	53.0	56.8	42.2	69.4	IBA Not Operatiing during this period
05:15	15:00	52.5	56.3	42.0	68.1	IBA Not Operatiing during this period
05:30	15:00	50.6	54.8	40.5	71.4	IBA Not Operatiing during this period
05:45	15:00	44.8	45.4	40.1	61.3	IBA Not Operatiing during this period
06:00	15:00	45.8	48.8	40.1	63.4	IBA Not Operatiing during this period
06:15	15:00	50.0	51.2	40.5	74.5	IBA Not Operatiing during this period
06:30	15:00	47.8	48.0	40.4	66.7	IBA Not Operatiing during this period
06:45	15:00	47.5	49.9	41.1	62.9	IBA Not Operatiing during this period
Average 2300-0700		50.2	53.7	41.0	44-77	
Average 0700-2300		48.7	50.5	44.9	53-72	

Noise Survey Results

Date: Sunday 21st April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 17**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	45.8	47.4	40.4	64.7	
07:15	15:00	49.9	53.6	41.5	63.6	
07:30	15:00	47.5	47.6	40.7	73.2	
07:45	15:00	45.3	47.6	39.0	63.0	
08:00	15:00	54.3	58.5	41.4	69.9	
08:15	15:00	49.4	51.2	39.9	71.5	
08:30	15:00	48.5	50.6	41.3	63.0	
08:45	15:00	50.7	51.9	41.3	68.2	
09:00	15:00	50.7	52.3	42.3	72.7	
09:15	15:00	51.7	53.8	43.0	74.0	
09:30	15:00	54.9	55.5	42.9	74.6	
09:45	15:00	47.2	49.9	41.9	65.0	
10:00	15:00	47.3	50.3	43.1	58.2	
10:15	15:00	47.1	50.1	42.1	58.7	
10:30	15:00	44.4	46.8	40.5	59.8	
10:45	15:00	46.6	49.2	41.7	60.2	
11:00	15:00	45.6	48.4	41.0	60.4	
11:15	15:00	45.8	48.9	40.4	60.2	
11:30	15:00	46.9	48.5	42.4	71.2	
11:45	15:00	46.1	48.8	41.7	58.5	
12:00	15:00	48.2	51.2	41.7	63.1	
12:15	15:00	49.2	52.2	42.6	64.8	
12:30	15:00	46.8	49.4	42.2	60.4	
12:45	15:00	64.5	49.6	41.4	92.9	
13:00	15:00	46.0	48.4	41.9	60.3	
13:15	15:00	45.5	47.4	42.6	61.8	
13:30	15:00	48.8	50.7	43.3	67.5	
13:45	15:00	49.7	52.0	46.0	61.5	
14:00	15:00	49.7	51.7	46.3	69.1	
14:15	15:00	49.0	51.2	46.0	60.3	
14:30	15:00	48.3	50.2	45.6	57.0	
14:45	15:00	48.6	50.5	45.7	58.6	
Average 0700-1500		52.2	51.3	42.7	57-93	

Noise Survey Results

Date: Sunday 21st April 2024 **TABLE 18**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	48.9	50.9	45.8	58.0	
15:15	15:00	49.7	52.2	46.4	59.8	
15:30	15:00	52.4	52.7	45.6	69.2	
15:45	15:00	49.6	51.9	45.9	61.5	
16:00	15:00	50.6	52.6	46.5	65.6	
16:15	15:00	49.8	51.8	46.1	65.0	
16:30	15:00	49.7	51.7	46.5	58.3	
16:45	15:00	50.7	52.6	46.6	65.6	
17:00	15:00	50.2	52.1	45.7	65.4	
17:15	15:00	49.7	51.6	46.2	64.3	
17:30	15:00	49.0	51.1	46.2	57.2	
17:45	15:00	49.1	50.9	45.4	71.0	
18:00	15:00	49.0	51.2	45.7	59.2	
18:15	15:00	49.0	50.1	45.3	66.5	
18:30	15:00	49.0	51.5	45.1	59.5	
18:45	15:00	50.0	52.1	46.4	66.4	
19:00	15:00	49.2	51.3	46.1	61.0	
19:15	15:00	49.6	51.5	45.9	71.1	
19:30	15:00	52.4	52.9	46.5	80.4	
19:45	15:00	51.0	53.5	47.2	62.9	
20:00	15:00	49.1	51.1	46.0	58.2	
20:15	15:00	49.5	51.5	46.3	55.9	
20:30	15:00	48.9	51.0	46.0	55.3	
20:45	15:00	48.7	50.6	45.8	61.0	
21:00	15:00	48.7	50.6	46.0	55.6	
21:15	15:00	48.4	50.5	45.6	53.7	
21:30	15:00	48.2	49.9	45.8	53.3	
21:45	15:00	47.8	49.3	45.8	51.5	
22:00	15:00	47.3	48.6	45.6	50.9	
22:15	15:00	47.8	49.2	45.9	51.8	
22:30	15:00	47.2	48.8	45.3	51.7	
22:45	15:00	46.2	48.0	43.7	50.8	
Average 1500-2300		49.4	51.2	45.9	51-80	

Noise Survey Results

Date: Sunday 21st - Monday 22nd April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 19**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	44.9	46.6	42.2	48.9	
23:15	15:00	44.5	46.1	42.6	48.3	
23:30	15:00	42.8	44.8	40.7	46.4	
23:45	15:00	39.6	41.3	37.0	47.8	
00:00	15:00	37.4	39.2	35.3	41.5	
00:15	15:00	37.5	39.4	35.1	44.1	
00:30	15:00	37.3	38.8	35.3	41.8	
00:45	15:00	37.8	39.1	36.2	48.1	
01:00	15:00	37.0	38.4	35.6	41.2	
01:15	15:00	37.1	38.5	35.6	41.5	
01:30	15:00	37.1	38.4	35.4	41.6	
01:45	15:00	37.2	38.1	36.1	43.3	
02:00	15:00	39.6	41.5	37.2	44.0	
02:15	15:00	42.1	43.5	39.6	48.4	
02:30	15:00	45.4	48.0	42.2	53.0	
02:45	15:00	48.6	49.9	46.8	53.3	
03:00	15:00	48.8	50.5	45.8	60.1	
03:15	15:00	48.3	50.1	45.7	58.1	
03:30	15:00	51.3	55.2	45.5	64.2	
03:45	15:00	54.5	58.4	47.4	66.7	
04:00	15:00	59.9	64.1	48.9	75.6	
04:15	15:00	57.1	59.5	50.5	73.3	
04:30	15:00	55.9	57.9	49.6	73.0	
04:45	15:00	55.3	58.8	48.7	69.0	
05:00	15:00	52.7	55.0	48.3	65.5	
05:15	15:00	52.2	54.2	47.2	68.2	
05:30	15:00	50.2	51.9	47.6	62.0	
05:45	15:00	52.8	52.5	47.4	71.2	
06:00	15:00	52.8	52.2	46.0	70.9	
06:15	15:00	50.5	52.7	46.7	66.5	
06:30	15:00	52.3	54.5	47.0	73.1	
06:45	15:00	52.2	50.6	46.4	78.3	
Average 2300-0700		51.3	54.0	45.3	49-78	
Average 0700-2300		51.0	51.3	44.6	51-93	

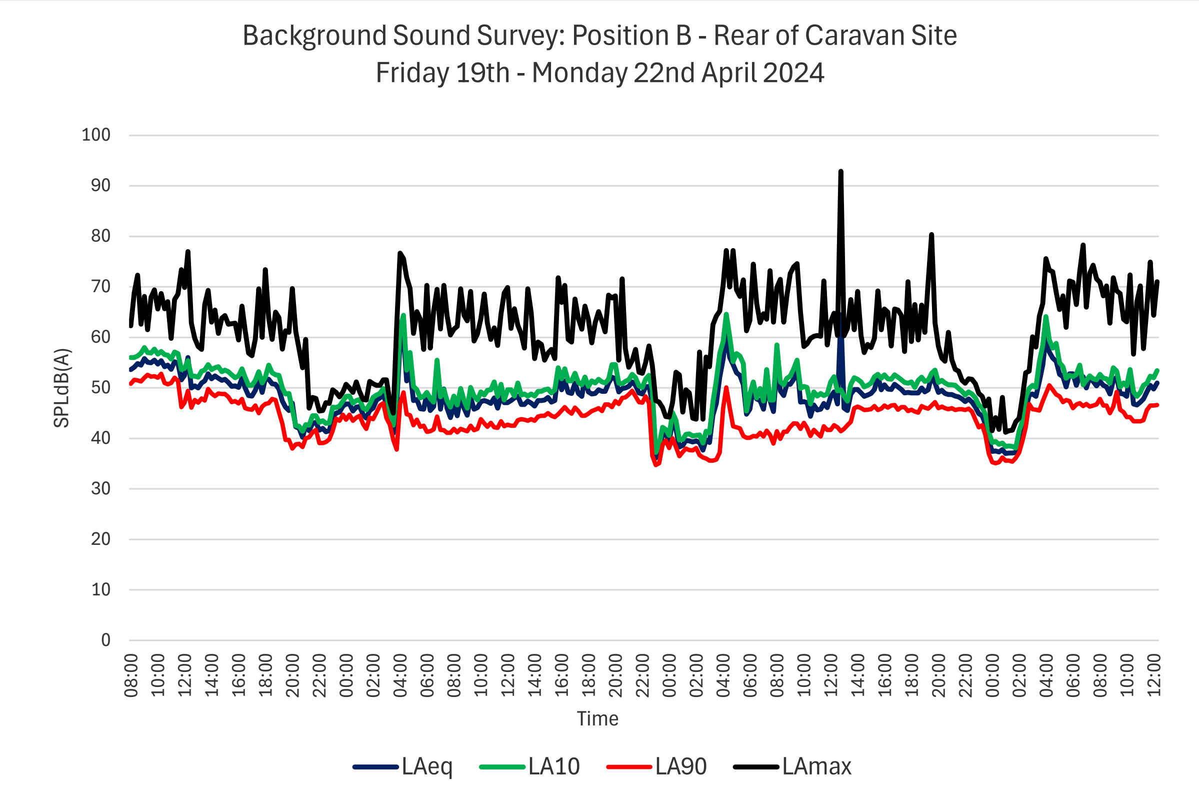
Noise Survey Results

Date: Monday 22nd April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 20**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position B - Rear of Caravan Park**
Instrumentation: Cirrus 171B Real Time Analyser (G056142)
Calibration: 94dB

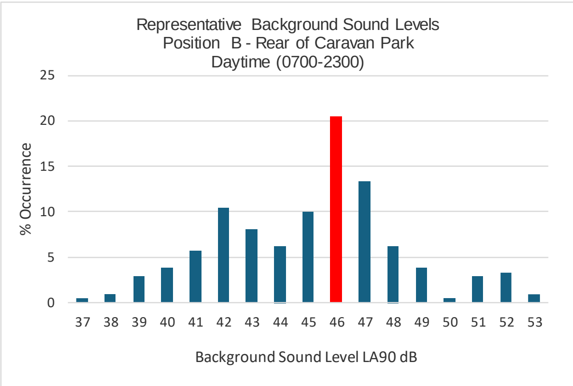
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	50.0	51.5	46.8	66.0	
07:15	15:00	52.0	52.4	46.3	72.7	
07:30	15:00	51.3	51.8	46.5	74.3	
07:45	15:00	50.4	51.6	46.7	71.6	
08:00	15:00	51.3	52.7	47.8	70.9	
08:15	15:00	50.5	51.9	46.5	68.2	
08:30	15:00	50.2	51.8	46.5	70.2	
08:45	15:00	48.8	50.9	45.0	62.8	
09:00	15:00	51.5	54.0	46.3	71.8	
09:15	15:00	52.1	53.3	49.2	69.2	
09:30	15:00	48.9	50.2	45.7	68.7	
09:45	15:00	48.8	51.0	45.2	63.6	
10:00	15:00	48.3	50.4	44.2	63.1	
10:15	15:00	53.4	53.6	44.2	72.4	
10:30	15:00	46.8	49.2	43.4	56.7	
10:45	15:00	46.6	48.3	43.4	67.1	
11:00	15:00	47.2	49.1	43.4	70.2	
11:15	15:00	47.8	50.5	43.6	57.8	
11:30	15:00	49.2	50.9	45.6	66.0	
11:45	15:00	50.5	52.3	46.5	74.9	
12:00	15:00	49.8	52.0	46.5	64.4	
12:15	15:00	51.0	53.4	46.6	71.0	
Average 0700-1230		50.1	51.7	45.9	57-75	

Overall Average	**50.8**	**53.7**	**44.7**	**49-78**	
Overall Average	**50.6**	**51.9**	**46.2**	**45-93**	

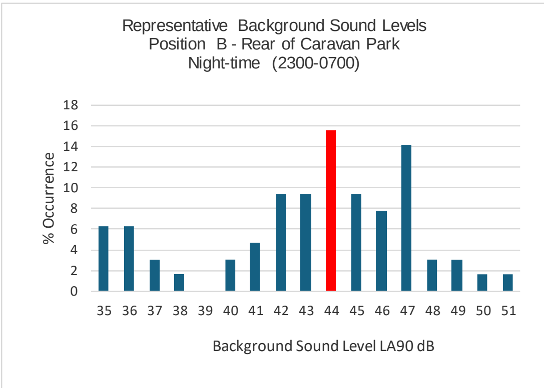
Average 0600-0700	**50.7**	**52.1**	**44.9**	**58-78**



LA90	% Occurrence
37	0.5
38	1.0
39	2.9
40	3.8
41	5.7
42	10.5
43	8.1
44	6.2
45	10.0
46	20.5
47	13.3
48	6.2
49	3.8
50	0.5
51	2.9
52	3.3
53	1.0



LA90	% Occurrence
35	6.3
36	6.3
37	3.1
38	1.6
39	0.0
40	3.1
41	4.7
42	9.4
43	9.4
44	15.6
45	9.4
46	7.8
47	14.1
48	3.1
49	3.1
50	1.6
51	1.6



Noise Survey Results

Date: Thursday 18th April 2024 **TABLE 21**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
18:00	15:00	56.9	58.2	51.0	73.3	Noise levels generally formed by Business Park acitivties, birdsong & Estuary sounds
18:15	15:00	56.7	57.0	50.7	75.2	
18:30	15:00	56.4	56.2	50.2	74.3	
18:45	15:00	55.4	57.3	50.5	76.3	
19:00	15:00	57.7	55.4	49.9	78.8	
19:15	15:00	56.7	57.7	50.4	74.7	
19:30	15:00	54.0	55.0	50.4	74.9	
19:45	15:00	54.7	55.0	50.5	74.8	
20:00	15:00	52.8	54.6	50.3	74.5	
20:15	15:00	52.5	53.9	50.3	67.3	
20:30	15:00	51.6	53.3	49.2	67.4	
20:45	15:00	51.9	53.5	49.6	59.8	
21:00	15:00	52.1	54.0	49.7	58.2	
21:15	15:00	52.1	54.0	49.5	58.7	
21:30	15:00	52.7	54.3	50.2	61.2	
21:45	15:00	53.0	54.7	50.8	58.5	
22:00	15:00	53.1	54.7	51.2	62.7	
22:15	15:00	52.4	54.0	50.3	58.2	
22:30	15:00	52.5	54.0	50.3	58.0	
22:45	15:00	52.9	54.6	50.8	66.3	
Average 1800-2300		54.3	55.3	50.3	58-79	

Noise Survey Results

Date: Thursday 18th - Friday 19th April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 22**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	52.7	54.2	50.5	59.5	
23:15	15:00	52.0	53.6	49.6	57.6	
23:30	15:00	51.4	53.2	49.1	56.7	
23:45	15:00	53.5	55.2	51.4	58.7	
00:00	15:00	51.6	53.3	49.5	58.4	
00:15	15:00	51.7	53.1	49.7	58.5	
00:30	15:00	50.2	52.0	47.6	58.2	
00:45	15:00	50.9	52.9	48.0	60.0	
01:00	15:00	51.5	53.7	48.6	59.9	
01:15	15:00	53.5	55.3	50.8	60.9	
01:30	15:00	54.1	55.9	51.6	60.8	
01:45	15:00	53.8	56.1	49.7	71.1	
02:00	15:00	49.7	51.9	47.1	56.3	
02:15	15:00	52.0	54.2	48.8	61.5	
02:30	15:00	52.5	54.6	49.6	60.4	
02:45	15:00	50.5	52.6	47.3	59.9	
03:00	15:00	53.3	56.1	48.6	61.3	
03:15	15:00	52.1	54.1	48.7	58.4	
03:30	15:00	52.6	54.6	49.6	59.7	
03:45	15:00	53.3	55.3	50.5	60.5	
04:00	15:00	52.8	55.0	49.5	63.5	
04:15	15:00	57.5	59.8	52.8	71.0	
04:30	15:00	57.6	60.0	53.6	70.1	
04:45	15:00	58.7	62.4	52.0	74.0	
05:00	15:00	55.2	56.9	51.8	72.9	
05:15	15:00	54.3	55.8	51.2	74.2	
05:30	15:00	54.9	57.0	51.1	71.0	
05:45	15:00	57.9	61.1	51.6	73.1	
06:00	15:00	55.9	58.5	52.2	66.7	
06:15	15:00	55.1	57.0	52.2	65.9	
06:30	15:00	55.2	56.4	51.4	73.8	
06:45	15:00	58.6	57.8	51.8	79.8	
Average 2300-0700		54.3	56.4	50.5	56-80	
Average 1800-2300		54.3	55.3	50.3	58-79	

Noise Survey Results

Date: Friday 19th April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 23**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	53.7	55.5	51.0	65.4	
07:15	15:00	53.6	55.5	50.5	64.2	
07:30	15:00	53.5	55.7	50.5	64.9	
07:45	15:00	55.0	56.7	50.8	68.7	
08:00	15:00	55.9	57.0	51.4	74.8	
08:15	15:00	56.2	57.2	52.1	72.0	
08:30	15:00	56.7	57.5	52.0	76.6	
08:45	15:00	54.0	55.9	51.5	67.0	
09:00	15:00	55.2	57.2	51.8	76.4	
09:15	15:00	54.6	56.2	52.4	60.6	
09:30	15:00	55.0	56.4	52.3	65.2	
09:45	15:00	54.6	56.4	52.2	65.6	
10:00	15:00	54.7	55.9	51.2	70.3	
10:15	15:00	54.1	55.7	51.8	68.2	
10:30	15:00	53.3	55.3	50.9	60.4	
10:45	15:00	55.1	55.2	50.7	75.2	
11:00	15:00	53.5	55.0	51.2	64.8	
11:15	15:00	59.5	62.8	51.3	77.6	
11:30	15:00	56.3	57.9	49.9	74.1	
11:45	15:00	52.2	50.5	43.7	74.6	
12:00	15:00	60.1	63.6	43.9	78.6	
12:15	15:00	62.0	63.7	48.9	85.1	
12:30	15:00	59.4	64.0	46.4	76.1	
12:45	15:00	56.5	57.0	47.7	78.9	
13:00	15:00	51.9	52.8	46.3	71.7	
13:15	15:00	52.0	53.8	46.8	68.1	
13:30	15:00	56.1	58.0	47.5	75.5	
13:45	15:00	52.8	55.1	48.6	68.6	
14:00	15:00	51.6	53.4	48.6	65.6	
14:15	15:00	53.2	55.2	48.7	68.4	
14:30	15:00	51.9	53.3	48.6	67.8	
14:45	15:00	58.6	58.6	49.0	81.3	
Average 0700-1500		55.9	58.0	50.2	60-85	

Noise Survey Results

TABLE 24

Date: Friday 19th April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	56.6	57.6	48.5	75.5	
15:15	15:00	55.6	56.1	48.8	79.6	
15:30	15:00	51.5	53.7	46.7	70.5	
15:45	15:00	55.5	54.8	47.2	75.0	
16:00	15:00	50.2	52.4	46.5	61.8	
16:15	15:00	50.9	53.1	46.9	66.8	
16:30	15:00	49.4	51.8	45.8	63.3	
16:45	15:00	58.2	61.5	45.9	74.0	
17:00	15:00	59.2	56.6	46.7	81.1	
17:15	15:00	56.8	56.5	47.4	76.7	
17:30	15:00	52.7	53.7	44.4	71.8	
17:45	15:00	55.1	56.6	45.7	71.6	
18:00	15:00	51.3	51.9	46.5	71.1	
18:15	15:00	52.9	56.3	46.7	68.3	
18:30	15:00	56.6	54.6	48.0	78.2	
18:45	15:00	50.1	53.3	41.7	60.8	
19:00	15:00	48.4	50.9	41.6	66.6	
19:15	15:00	47.1	45.8	36.7	66.7	
19:30	15:00	53.7	49.8	36.0	74.4	
19:45	15:00	53.5	51.7	35.1	76.0	
20:00	15:00	36.9	38.2	33.0	52.9	
20:15	15:00	35.4	36.5	33.2	54.0	
20:30	15:00	34.4	35.5	32.9	48.8	
20:45	15:00	35.5	36.7	32.5	51.0	
21:00	15:00	36.2	37.0	35.1	45.2	
21:15	15:00	36.1	37.1	34.8	47.4	
21:30	15:00	38.2	40.7	35.5	45.4	
21:45	15:00	42.3	44.2	40.3	47.8	
22:00	15:00	37.6	40.0	35.4	43.3	
22:15	15:00	37.3	38.5	35.8	41.4	
22:30	15:00	35.0	36.2	33.2	45.8	
22:45	15:00	38.1	40.1	35.8	42.0	
Average 1500-2300		52.4	53.1	44.0	41-81	

Noise Survey Results

Date: Friday 19th -Saturday 20th April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 25**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	38.7	40.0	37.1	42.4	
23:15	15:00	43.1	45.1	40.0	47.2	
23:30	15:00	43.1	44.4	40.9	48.8	
23:45	15:00	45.2	46.9	42.1	50.2	
00:00	15:00	45.6	46.7	43.8	48.4	
00:15	15:00	45.8	47.5	43.4	49.2	
00:30	15:00	43.3	45.6	40.2	50.9	
00:45	15:00	45.5	46.9	43.6	49.7	
01:00	15:00	45.4	46.6	44.1	48.5	
01:15	15:00	43.3	44.8	40.6	46.6	
01:30	15:00	46.0	49.3	41.5	53.0	
01:45	15:00	46.7	47.8	45.1	52.1	
02:00	15:00	49.2	51.7	45.3	53.6	
02:15	15:00	46.7	48.8	44.1	51.1	
02:30	15:00	50.0	51.7	47.5	53.3	
02:45	15:00	49.5	51.0	47.4	54.9	
03:00	15:00	49.5	52.0	44.0	55.7	
03:15	15:00	51.8	54.1	44.4	57.2	
03:30	15:00	43.5	46.1	39.0	54.6	
03:45	15:00	40.2	41.5	37.3	60.5	
04:00	15:00	53.8	57.3	41.6	72.3	
04:15	15:00	54.5	57.8	46.7	69.2	
04:30	15:00	56.8	58.3	45.1	75.8	
04:45	15:00	49.4	53.1	43.4	63.1	
05:00	15:00	45.7	47.9	41.4	59.2	
05:15	15:00	45.3	48.1	40.9	57.8	
05:30	15:00	47.4	49.1	41.9	64.4	
05:45	15:00	49.8	53.7	41.0	72.3	
06:00	15:00	51.1	55.4	40.2	67.9	
06:15	15:00	47.5	50.6	41.3	62.2	
06:30	15:00	51.4	55.8	42.4	64.7	
06:45	15:00	49.3	53.0	42.5	62.4	
Average 2300-0700		49.2	51.9	43.2	42-76	
Average 0700-2300		54.0	55.9	45.8	41-85	

Noise Survey Results

Date: Saturday 20th April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 26**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	46.3	49.0	42.2	60.0	
07:15	15:00	48.9	51.8	42.1	63.3	
07:30	15:00	50.6	54.8	41.5	65.4	
07:45	15:00	48.0	51.5	41.4	69.8	
08:00	15:00	52.0	55.4	40.6	70.6	
08:15	15:00	51.6	50.4	39.9	72.5	
08:30	15:00	50.8	54.2	41.4	72.8	
08:45	15:00	45.8	48.5	40.2	61.0	
09:00	15:00	49.6	51.5	40.6	68.6	
09:15	15:00	48.8	51.5	40.0	69.1	
09:30	15:00	47.1	49.8	40.4	67.6	
09:45	15:00	49.6	53.1	43.4	64.2	
10:00	15:00	52.2	53.3	43.3	71.1	
10:15	15:00	50.0	52.9	43.3	66.2	
10:30	15:00	46.9	49.5	42.4	59.9	
10:45	15:00	52.5	49.7	43.2	83.3	
11:00	15:00	48.9	50.9	41.7	71.2	
11:15	15:00	49.0	50.4	42.9	68.8	
11:30	15:00	49.0	50.8	42.6	67.6	
11:45	15:00	56.4	55.8	43.3	76.7	
12:00	15:00	50.3	51.5	42.8	72.1	
12:15	15:00	55.0	59.7	42.8	71.6	
12:30	15:00	53.7	56.6	42.0	72.2	
12:45	15:00	49.9	52.1	42.9	73.9	
13:00	15:00	49.4	49.8	42.9	68.6	
13:15	15:00	47.3	49.4	43.6	62.2	
13:30	15:00	48.6	48.5	42.9	68.3	
13:45	15:00	49.0	50.8	44.4	65.8	
14:00	15:00	48.2	50.3	44.4	60.6	
14:15	15:00	48.5	50.5	44.9	67.9	
14:30	15:00	50.2	52.7	45.1	68.6	
14:45	15:00	59.6	63.4	45.3	79.5	
Average 0700-1500		51.4	53.9	42.7	60-83	

Noise Survey Results

Date: Saturday 20th April 2024 **TABLE 27**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	54.2	52.7	45.3	76.0	
15:15	15:00	52.8	52.9	44.7	70.9	
15:30	15:00	54.7	58.2	44.9	71.2	
15:45	15:00	51.4	52.5	43.8	71.0	
16:00	15:00	55.0	56.6	44.9	74.2	
16:15	15:00	55.5	55.3	45.4	77.0	
16:30	15:00	53.7	54.1	45.2	74.6	
16:45	15:00	48.0	50.5	44.0	60.4	
17:00	15:00	49.1	50.9	44.1	69.0	
17:15	15:00	49.0	51.3	45.0	61.3	
17:30	15:00	46.6	48.6	43.8	57.7	
17:45	15:00	49.6	51.1	44.7	74.5	
18:00	15:00	49.2	51.7	45.3	61.3	
18:15	15:00	48.9	51.0	45.1	61.0	
18:30	15:00	49.4	51.4	46.2	62.0	
18:45	15:00	49.4	51.4	46.0	61.2	
19:00	15:00	50.9	53.1	47.0	67.1	
19:15	15:00	53.3	52.9	47.5	78.7	
19:30	15:00	49.6	50.6	47.0	67.4	
19:45	15:00	60.3	54.4	46.6	87.2	
20:00	15:00	49.2	50.7	47.0	55.3	
20:15	15:00	48.6	50.1	46.4	54.2	
20:30	15:00	49.7	50.8	47.6	66.9	
20:45	15:00	49.6	51.0	47.6	54.9	
21:00	15:00	50.8	52.5	48.5	56.0	
21:15	15:00	52.3	54.2	49.8	57.3	
21:30	15:00	51.7	53.4	49.4	56.1	
21:45	15:00	49.5	51.1	47.1	53.8	
22:00	15:00	49.6	51.1	47.9	54.1	
22:15	15:00	49.9	51.7	47.2	55.8	
22:30	15:00	47.7	49.5	45.4	53.0	
22:45	15:00	43.1	47.4	34.0	51.5	
Average 1500-2300		52.0	52.6	46.3	52-87	

Noise Survey Results

Date: Saturday 20th - Sunday 21st April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 28**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	34.9	36.0	33.4	45.6	IBA Not Operatiing during this period
23:15	15:00	37.0	38.4	34.1	46.2	IBA Not Operatiing during this period
23:30	15:00	39.2	40.1	38.0	45.2	IBA Not Operatiing during this period
23:45	15:00	38.8	39.7	37.8	44.1	IBA Not Operatiing during this period
00:00	15:00	38.5	39.3	37.4	40.7	IBA Not Operatiing during this period
00:15	15:00	39.9	41.2	38.6	45.4	IBA Not Operatiing during this period
00:30	15:00	39.2	40.4	35.5	55.4	IBA Not Operatiing during this period
00:45	15:00	35.3	36.9	33.5	41.3	IBA Not Operatiing during this period
01:00	15:00	35.8	37.1	34.0	42.6	IBA Not Operatiing during this period
01:15	15:00	36.5	38.4	34.2	40.4	IBA Not Operatiing during this period
01:30	15:00	36.2	37.4	34.5	52.8	IBA Not Operatiing during this period
01:45	15:00	35.2	36.5	33.7	45.9	IBA Not Operatiing during this period
02:00	15:00	35.6	36.6	34.3	40.8	IBA Not Operatiing during this period
02:15	15:00	38.3	40.5	34.5	51.5	IBA Not Operatiing during this period
02:30	15:00	35.7	37.0	33.5	39.2	IBA Not Operatiing during this period
02:45	15:00	38.5	40.4	31.9	54.5	IBA Not Operatiing during this period
03:00	15:00	37.2	39.5	31.8	53.2	IBA Not Operatiing during this period
03:15	15:00	37.5	39.7	32.5	50.7	IBA Not Operatiing during this period
03:30	15:00	35.4	37.2	33.2	48.7	IBA Not Operatiing during this period
03:45	15:00	36.9	38.0	34.8	50.2	IBA Not Operatiing during this period
04:00	15:00	50.6	54.9	37.9	63.2	IBA Not Operatiing during this period
04:15	15:00	54.5	57.8	46.7	67.1	IBA Not Operatiing during this period
04:30	15:00	52.0	55.6	43.1	69.1	IBA Not Operatiing during this period
04:45	15:00	50.8	54.9	40.8	65.3	IBA Not Operatiing during this period
05:00	15:00	49.2	49.5	39.1	65.6	IBA Not Operatiing during this period
05:15	15:00	47.4	50.9	39.9	59.9	IBA Not Operatiing during this period
05:30	15:00	51.8	55.4	40.2	74.5	IBA Not Operatiing during this period
05:45	15:00	50.2	54.9	39.3	68.2	IBA Not Operatiing during this period
06:00	15:00	46.6	49.7	39.7	65.6	IBA Not Operatiing during this period
06:15	15:00	48.9	51.7	39.8	64.6	IBA Not Operatiing during this period
06:30	15:00	45.4	48.1	39.7	59.8	IBA Not Operatiing during this period
06:45	15:00	44.1	44.7	39.9	68.4	IBA Not Operatiing during this period
Average 2300-0700		46.2	49.6	38.4	39-75	
Average 0700-2300		51.7	53.3	44.8	52-87	

Noise Survey Results

Date: Sunday 21st April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 29**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	53.0	55.6	38.6	68.3	
07:15	15:00	45.8	48.4	40.7	63.5	
07:30	15:00	43.6	46.4	39.9	54.3	
07:45	15:00	47.2	49.4	38.5	64.8	
08:00	15:00	47.4	50.7	39.1	66.3	
08:15	15:00	44.7	47.5	38.6	58.3	
08:30	15:00	51.4	54.2	39.1	66.5	
08:45	15:00	53.0	54.8	41.0	69.4	
09:00	15:00	48.3	52.0	41.0	63.2	
09:15	15:00	45.2	47.8	39.5	60.1	
09:30	15:00	50.7	53.7	40.2	66.7	
09:45	15:00	49.0	52.4	38.7	65.1	
10:00	15:00	44.2	46.7	38.0	60.7	
10:15	15:00	46.8	48.6	37.3	72.1	
10:30	15:00	43.6	47.6	37.1	55.0	
10:45	15:00	48.6	53.0	38.5	62.1	
11:00	15:00	51.6	54.2	38.0	78.4	
11:15	15:00	49.9	51.6	36.3	69.5	
11:30	15:00	48.1	48.0	40.0	72.5	
11:45	15:00	44.1	46.0	38.4	63.3	
12:00	15:00	45.8	49.0	39.8	61.7	
12:15	15:00	46.6	49.4	40.3	63.6	
12:30	15:00	46.4	47.7	41.0	65.3	
12:45	15:00	47.5	49.4	37.9	64.4	
13:00	15:00	45.5	47.5	41.4	61.2	
13:15	15:00	48.2	48.9	41.8	64.7	
13:30	15:00	49.5	51.7	43.9	68.6	
13:45	15:00	49.0	51.6	45.0	62.0	
14:00	15:00	50.6	52.9	46.2	66.1	
14:15	15:00	52.9	55.3	45.6	75.0	
14:30	15:00	48.6	49.9	44.7	72.3	
14:45	15:00	47.8	49.3	44.5	64.9	
Average 0700-1500		48.8	51.2	41.2	54-78	

Noise Survey Results

Date: Sunday 21st April 2024 **TABLE 30**
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
15:00	15:00	48.8	51.2	45.1	60.1	
15:15	15:00	49.9	52.8	45.2	64.5	
15:30	15:00	46.6	48.3	44.2	55.0	
15:45	15:00	49.0	51.5	45.0	62.5	
16:00	15:00	49.2	51.5	45.8	64.4	
16:15	15:00	49.9	52.9	45.3	61.2	
16:30	15:00	48.6	51.1	45.0	58.7	
16:45	15:00	48.7	50.7	45.1	64.9	
17:00	15:00	49.6	51.4	45.2	66.9	
17:15	15:00	52.5	53.3	45.8	74.1	
17:30	15:00	48.7	51.0	44.9	63.0	
17:45	15:00	47.7	50.0	44.4	57.8	
18:00	15:00	47.7	49.9	44.4	56.6	
18:15	15:00	48.0	49.8	44.6	68.3	
18:30	15:00	49.7	52.2	45.2	65.8	
18:45	15:00	48.5	50.8	44.6	61.8	
19:00	15:00	48.5	50.8	45.2	61.3	
19:15	15:00	48.4	50.5	44.8	64.4	
19:30	15:00	50.2	52.0	45.5	66.7	
19:45	15:00	50.8	53.5	45.8	64.8	
20:00	15:00	48.3	50.8	44.8	55.8	
20:15	15:00	48.3	50.5	45.4	56.4	
20:30	15:00	48.9	50.9	45.9	55.0	
20:45	15:00	48.9	50.8	46.0	55.2	
21:00	15:00	48.7	50.8	45.6	56.5	
21:15	15:00	47.7	50.1	44.6	54.2	
21:30	15:00	46.5	48.3	44.3	52.8	
21:45	15:00	46.0	47.4	44.3	50.4	
22:00	15:00	46.4	47.8	44.6	49.7	
22:15	15:00	46.2	47.5	44.2	51.9	
22:30	15:00	46.2	47.6	44.0	50.6	
22:45	15:00	45.8	47.6	43.2	50.8	
Average 1500-2300		48.6	50.7	44.9	50-74	

Noise Survey Results

Date: Sunday 21st - Monday 22nd April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 31**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

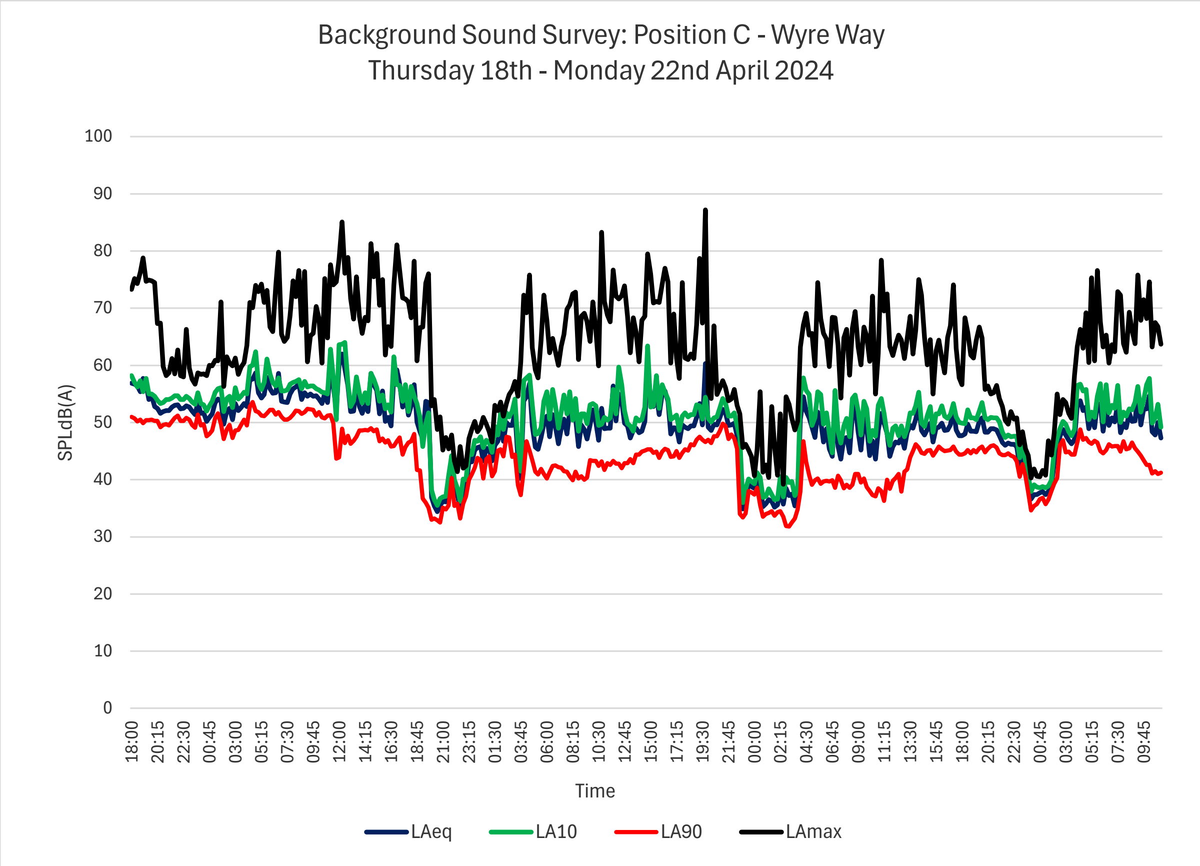
Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
23:00	15:00	42.3	43.8	40.5	46.1	
23:15	15:00	44.4	45.8	42.7	48.4	
23:30	15:00	42.2	43.3	40.6	45.4	
23:45	15:00	39.4	40.6	37.7	44.2	
00:00	15:00	36.6	37.9	34.6	40.3	
00:15	15:00	37.4	39.1	35.4	41.9	
00:30	15:00	37.4	38.7	35.7	40.6	
00:45	15:00	37.7	38.6	36.6	40.5	
01:00	15:00	37.9	38.8	36.8	41.6	
01:15	15:00	37.4	38.6	35.7	40.8	
01:30	15:00	37.9	38.9	36.5	46.8	
01:45	15:00	39.0	39.9	38.0	44.3	
02:00	15:00	42.8	45.1	39.3	48.1	
02:15	15:00	43.7	47.3	40.3	55.0	
02:30	15:00	47.6	48.9	46.0	51.4	
02:45	15:00	48.8	50.2	46.9	54.0	
03:00	15:00	47.8	49.7	44.8	53.5	
03:15	15:00	46.9	48.4	44.9	51.6	
03:30	15:00	46.3	47.7	44.4	50.7	
03:45	15:00	47.0	48.8	44.4	58.3	
04:00	15:00	53.0	56.5	46.5	63.3	
04:15	15:00	53.8	56.7	48.8	66.3	
04:30	15:00	52.1	55.5	47.0	63.0	
04:45	15:00	52.7	55.8	47.3	69.2	
05:00	15:00	48.9	50.5	46.6	60.5	
05:15	15:00	51.0	51.8	46.3	75.3	
05:30	15:00	49.1	50.9	46.8	60.8	
05:45	15:00	53.4	54.6	46.5	76.6	
06:00	15:00	52.9	56.8	45.0	67.6	
06:15	15:00	48.5	50.1	44.6	63.2	
06:30	15:00	52.1	56.6	45.2	65.3	
06:45	15:00	49.5	51.7	46.2	60.4	
Average 2300-0700		48.5	51.2	44.2	46-77	
Average 0700-2300		48.7	51.0	43.4	50-78	

Noise Survey Results

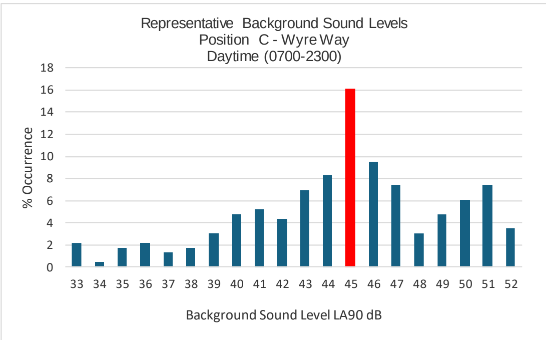
Date: Monday 22nd April 2024
Location: Hillhouse Business Park, Thornton-Cleveleys, Lancashire **TABLE 32**
Client: Axis
Project: Hillhouse IBA Facility
Data: **Baseline Sound Survey: Position C - Wyre Way**
Instrumentation: Cirrus 171A Real Time Analyser (G304789)
Calibration: 94dB

Start Time	Run Time (mins.)	LAeq (dB)	LA10 (dB)	LA90 (dB)	LAmax (dB)	Observations
07:00	15:00	50.8	53.0	45.8	63.6	
07:15	15:00	50.1	52.5	45.9	62.4	
07:30	15:00	53.4	56.5	45.9	72.9	
07:45	15:00	48.2	50.0	44.9	72.3	
08:00	15:00	49.8	51.8	46.7	63.8	
08:15	15:00	49.1	51.1	45.3	62.3	
08:30	15:00	51.7	52.4	45.5	69.3	
08:45	15:00	50.2	52.2	46.5	66.1	
09:00	15:00	50.3	53.6	45.5	63.8	
09:15	15:00	55.1	56.3	44.9	75.8	
09:30	15:00	49.6	51.8	44.2	67.9	
09:45	15:00	52.3	53.9	43.4	71.5	
10:00	15:00	52.4	56.6	42.6	68.2	
10:15	15:00	54.7	57.7	42.6	74.6	
10:30	15:00	48.4	49.9	41.1	63.2	
10:45	15:00	47.8	50.8	41.5	67.5	
11:00	15:00	50.0	53.2	41.0	66.8	
11:15	15:00	47.3	49.2	41.2	63.7	
Average 0700-1130		51.2	53.6	44.5	62-76	

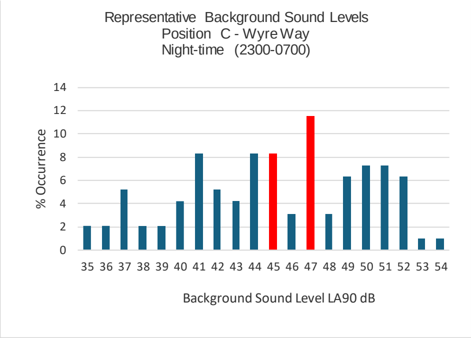
Overall Average	**51.5**	**53.8**	**47.2**	**39-80**	
Overall Average	**52.4**	**54.1**	**46.4**	**41-89**	



LA90	% Occurrence
33	2.2
34	0.4
35	1.7
36	2.2
37	1.3
38	1.7
39	3.0
40	4.8
41	5.2
42	4.3
43	7.0
44	8.3
45	16.1
46	9.6
47	7.4
48	3.0
49	4.8
50	6.1
51	7.4
52	3.5



LA90	% Occurrence
35	2.1
36	2.1
37	5.2
38	2.1
39	2.1
40	4.2
41	8.3
42	5.2
43	4.2
44	8.3
45	8.3
46	3.1
47	**11.5**
48	3.1
49	6.3
50	7.3
51	7.3
52	6.3
53	1.0
54	1.0



Appendix 7.4 –

Assumed Noise Levels for Site Plant

& Cladding Performance

Noise Levels for Site Plant & Cladding Performance

(including additional noise mitigation measures)

Plant Type or Area	Treatment (Cladding Performance Rw) dB	Sound Power (SWL) Sound Pressure Level (SPL) at roof/walls	Assumed % Operating Time	Period of Operation
IBA Storage building (IBA input store area)	Cladding Rw 38dB (SW wall) Concrete lower wall (3m)	80 (Rev SPL)	100	Daytime/Night-time
IBA Storage building (IBA input store area)	Cladding to Roof Rw 34dB (perforated inner skin with rockwool & solid outer skin)	80 (Rev SPL)	100	Daytime/Night-time
IBA Storage building (IBA input store area)	Cladding Rw 24dB (NW wall) Concrete lower wall (3m)	80 (Rev SPL)	100	Daytime/Night-time
IBA Store (processed IBA)	Cladding (single skin) to walls & roof Rw 24dB	67 (Rev SPL)	100	Daytime/Night-time
IBA Store (processed IBA) Dividing wall	Cladding (single skin) Rw 24	67 (Rev SPL)	100	Daytime/Night-time
Processing Building	Roof & Walls Rw 38dB	90 (Rev SPL)	100	Daytime/Night-time
Conveyor between Processing building & IBA Store	Enclosed Rw 24dB cladding	80 (SWL)	100	Daytime/Night-time
Metal Storage building	Cladding Rw 38dB (walls/roof). Concrete lower wall (3m)	89 (Rev SPL)	100	Daytime
HGV	-	72 @ 10m (SPL)	9 per hour (day) each way	Daytime
Processing Building Door	Insulated electric roller shutter door Rw 18dB	90 (Rev SPL)	100	Daytime/Night-time
Mobile Plant	Fitted with non-tonal reversing alarms	-	Variable	Daytime/Night-time
Noise Character (i.e. tonal, impulsivity and intermittency)	Design of plant to ensure no perceptible noise character at NSR	-	100	Daytime/Night-time
Tractor/Trailer	-	106 (SWL)	6 per hour	Daytime
Telehandler	-	103 (SWL)	Variable (10 per hour)	Daytime/Night-time

Appendix 7.5 –

Noise Model Settings & Mapping Results

INPUT DATA FOR ISO 9613 CALCS

Noise Prediction Model

There are a number of empirical or semi-empirical sound propagation models in common use. One of these is ISO9613-2 which is the International Standard used to predict noise propagation.

The noise levels produced by the IBA plant at each of the nearest sensitive receptors has been calculated using a computer model, which is based on ISO 9613, Acoustics – Attenuation of Sound During Propagation Outdoors [1996]. The propagation model described in Part 2 of the standard provides a method for predicting sound pressure levels.

The computer model utilises octave band frequency data of the noise source to assess and predict the noise contribution with the site in full operation.

The ISO propagation model provides a method for calculating the sound pressure level at a specific position by taking the sound power level radiating from the building facades in frequency bands and subtracting a number of attenuation factors according to the following:

Predicted sound pressure level =

$Lw + D – A_{geo} – A_{gr} – A_{bar} - A_{misc}$

The prediction modelling uses octave band frequency sound power level data calculated in different wall and roof areas of the IBA plant and corrects the level for the following additional propagation factors and attenuation:

Octave band frequency spectra:
Based on empirical noise measurements recorded at a similar site in the UK when under load conditions. The noise levels at specific face positions are provided below that have been used for the noise model.

D – Directivity Factor
The Directivity Index will depend on the radiating surface and whether it is located in free space, at junction of two surfaces or more and the correction factor changes accordingly. Directivity factor is generally = 2.

A_{geo} - Geometrical Divergence
The geometrical divergence of sound waves accounts for the spherical spreading in the free field from a point source resulting in attenuation depending on distance, which relates to the following correction:

$A_{geo} = 20 \times \log(d) + 11$ [where d = distance from the noise source]

Receiver height assumed = Daytime = 1.5m, Night-time = 4.0m above ground level (except for caravan site and ecological receptors where the height assumed is 1.5m during night-time).

A_{atm} - Atmospheric Absorption

When sound energy propagates through the atmosphere it is attenuated as a result of the conversion of the sound energy into heat. The attenuation is dependent upon the relative humidity and the temperature of the air through which the sound energy is travelling. The attenuation is also dependent upon the frequency content of the sound energy with higher levels of attenuation towards higher frequencies.
The attenuation therefore depends upon the distance from the sound source and according to ISO9613 is calculated according to the following formula:

A_{atm} = d x α [Where d = distance from the source
a = atmospheric absorption coefficient in dB/m]

From ISO9613 Part 1 [1996] I have used values of `a' corresponding to a temperature of 10ºC and a relative humidity of 70%. This will give an indication of the lowest likely atmospheric attenuation as examples worked at 20deg C and -5deg C indicate a reduction of around -0.5dB(A) on those values calculated. The values for each one-third octave band are given below in table 1.

Table 1: Atmospheric absorption attenuation based on temperature of 10ºC and a relative humidity of 70%

Third Octave Band Centre Frequency (Hz)	**50**	**63**	**80**	**100**	**125**	**160**	**200**	**250**
Atmospheric Absorption Coefficient (dB/km)	0.0785	0.122	0.186	0.28	0.411	0.584	0.797	1.04
Third Octave Band Centre Frequency (Hz)	**315**	**400**	**500**	**630**	**800**	**1k**	**1.25k**	**1.6k**
Atmospheric Absorption Coefficient (dB/km)	1.31	1.6	1.93	2.33	2.87	3.66	4.86	6.73
Third Octave Band Centre Frequency (Hz)	**2k**	**2.5k**	**3.15k**	**4k**	**5k**	**6.3k**	**8k**	**10k**
Atmospheric Absorption Coefficient (dB/km)	9.66	14.3	21.5	32.8	50.2	76.9	117	175

A_{gr} – Ground Effect

Ground Effect for Calcs

G = 0.5 (mixed ground absorption)

The ground effect is a result of the interference of sound reflected by the ground which interferes with the direct sound propagating from the noise source to the receiver. The prediction of the ground effects is relatively complex and is dependent upon a number of factors including ground conditions, source height, receiver height and the propagation height between the source and receiver. The ground conditions are described according to a variable `G' which varies between 0 for `hard' ground and 1 for `soft' ground. Hard ground refers to paving, concrete and any sites with low porosity. Soft ground refers to grassland, trees or other vegetation. I have assumed a ground factor of G = 1 (hard ground) for areas within the Site boundary and G = 0 to represent a soft ground absorption to NSR as intervening ground is generally formed mainly by a mixture of vacant undeveloped land and woodland/grassed areas and is therefore appropriate. I have taken the source height as being the height of the relevant section of building and a receiver height of 1.5 metres for daytime and 4 metres for night-time operations for residential receptors (except caravans and ecological receptors at 1.5m for night-time).

A_{bar} – Barrier Attenuation

When there is a solid barrier between any noise source and the receiver position the noise level will be reduced. The level of attenuation resulting will depend upon the barrier position, barrier size, receiver position and frequency content relative to the noise source. For the purpose of these calculations, we have not included any local screening from existing industrial buildings adjacent to the Site or local garden screening. We have included any earth mound screening on intervening land between the Site and the caravan park and to the eastern boundary relative to the saltmarsh and mudflat areas.

A_{misc} – Miscellaneous Other Effects

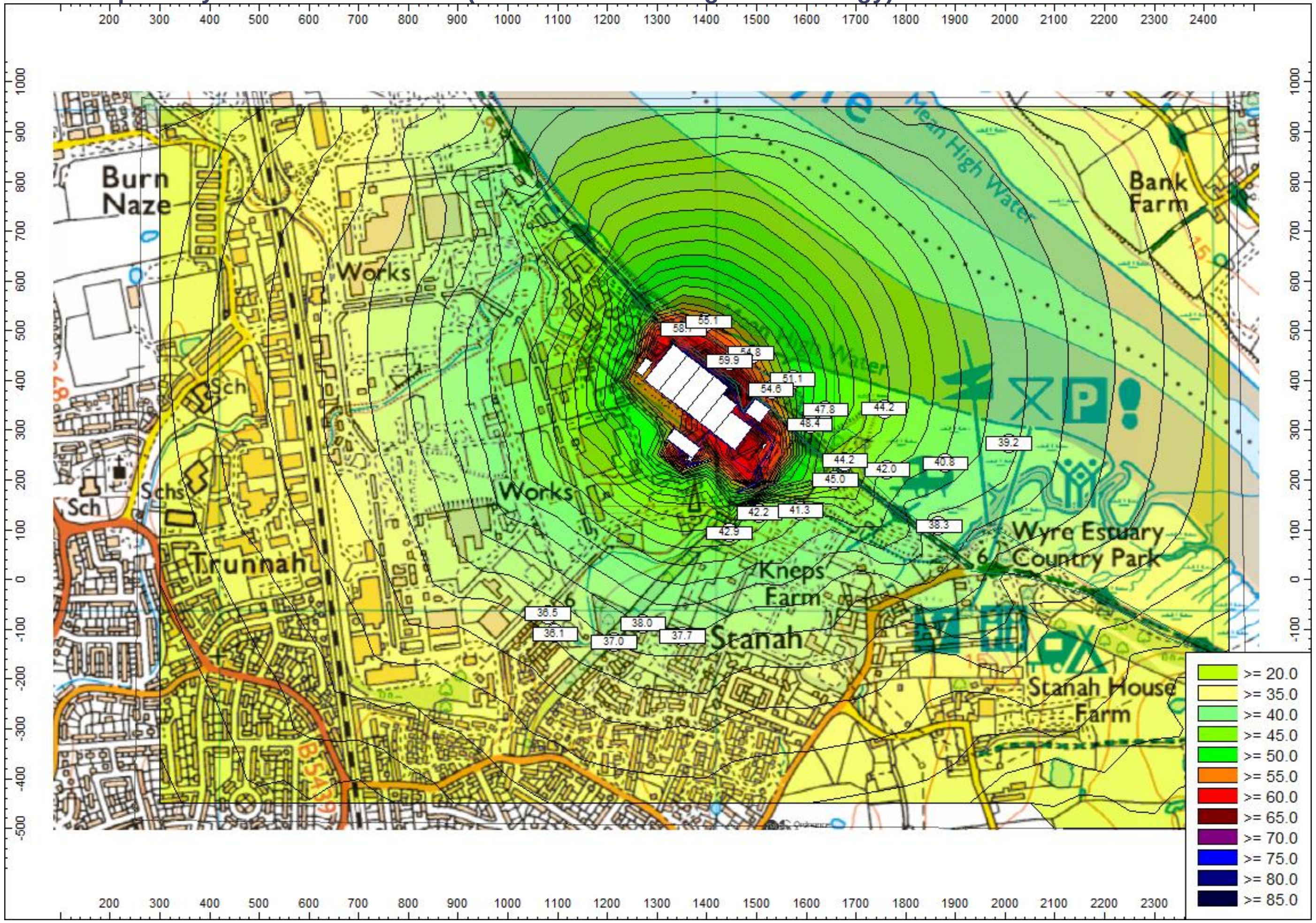
This additional attenuation effect described in ISO9613 allows for the effects of propagation through foliage. I have not taken account of any such effects and in my expert opinion they are unlikely to significantly reduce noise levels below those predicted.

Mobile Plant Noise Sources

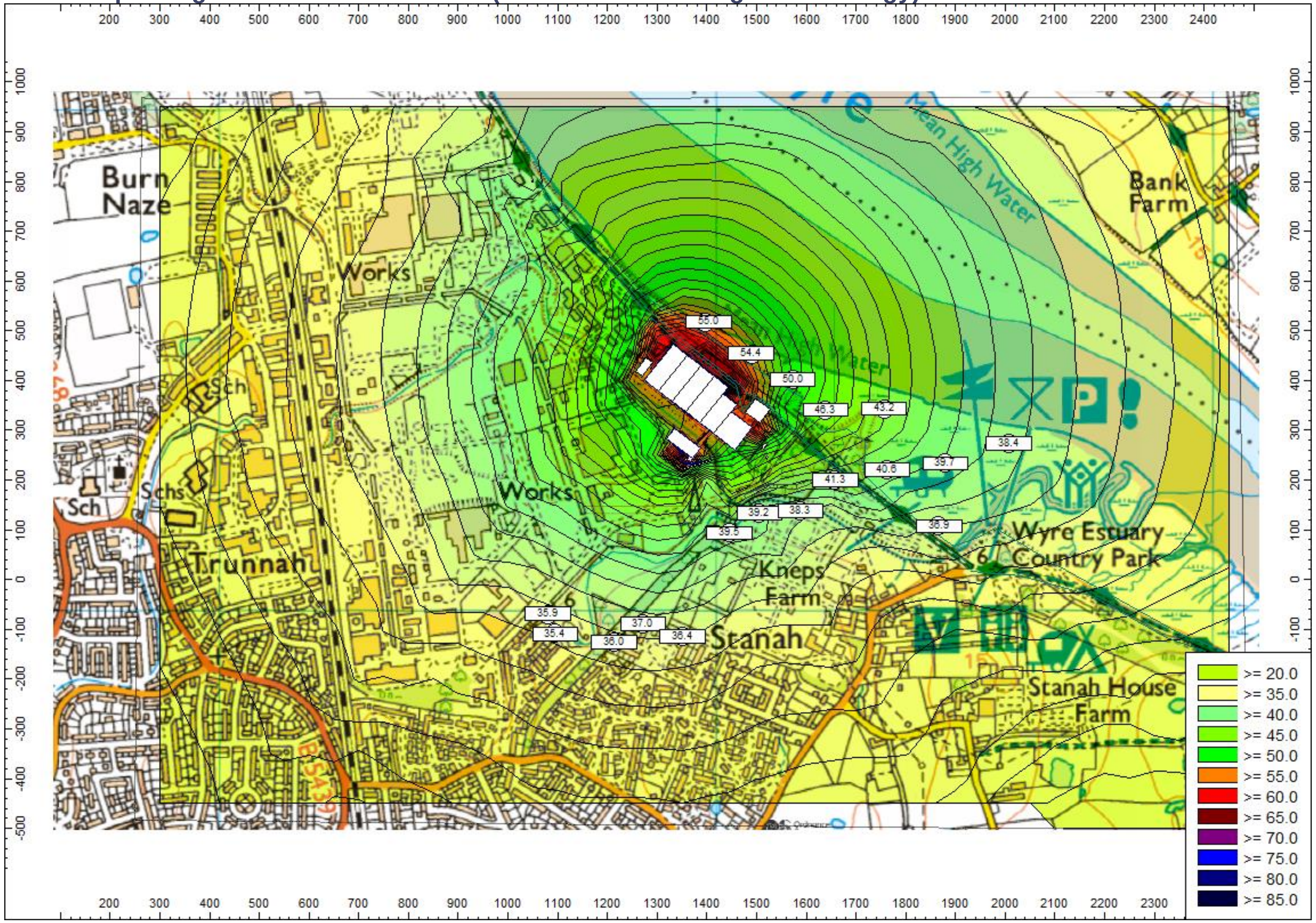
The noise model allows for HGV movement within the site boundary (based on a line source). These are accounted for during the daytime operating period based on 9 HGV movements in and out per hour for the Proposed IBA facility. Additional mobile plant movement between the Processing and Storage buildings is allowed based on 6 movements per hour and 10 movements per hour between the skip area at the Processing building and the skip covered storage area.

Noise Mapping Results

Noise Map 1: Daytime Noise Contours (with Additional Mitigation Strategy)



Noise Map 2: Night-time Noise Contours (with Additional Mitigation Strategy)



Appendix 7.6 –

Construction & Decommissioning Plant Inventory

Construction Plant Inventory

Soil Movements:

Plant Type	Sound Power Level	SPL at 10m LAeq dB	SPL at 10m LAmax dB
Dozer	106	78	83
Excavator/Loader	103	75	78-80
Dump Truck	107	79	82-85
8 Wheel Tipper	107	79	84
Lorry	103	75	80

Piling:

Plant Type	Sound Power Level	SPL at 10m LAeq dB	SPL at 10m LAmax dB
Piling Rig (non-percussive)	111	83	91
Truck Mixer	107	79	85
Concrete Pump	110	82	84
Poker Vibrator	106	78	82
Lorry	103	75	80

General Site Noisy Activities:

Plant Type	Sound Power Level	SPL at 10m LAeq dB	SPL at 10m LAmax dB
Excavator	104	76	79-81
HGV	103	75	80
Dumper	104	76	78
Telehandler	105	77	82
Compressor	95	67	70
Generator	103	75	77
Mobile Crane	101	73	76

Infrastructure Construction:

Plant Type	Sound Power Level	SPL at 10m LAeq dB	SPL at 10m LAmax dB
Asphalt Melter	103	75	79
Asphalt Spreader	96	68	71
Road Roller	102	74	79
Lorry	103	75	80
Poker Vibrator	106	78	82
Concrete pump	103	75	77
Compressor	95	67	70

Building Construction:

Plant Type	Sound Power Level	SPL at 10m LAeq dB	SPL at 10m LAmax dB
Excavator	106	78	81-83
Steelwork Erection	108	80	88
Concrete Pump	103	75	77
Concrete Vibrators	106	78	82
HGV	103	75	80
Cutting/Grinding	107	79	87
Hydraulic Pump	106	78	81

Decommissioning Plant Inventory

Plant Item	Activity Equivalent Continuous Sound Pressure Level L_{Aeq} (dB)	Sound Power Level
Water Jet Pump	63 @ 10m	**91**
Mobile Crane	70 @ 10m	**101**
Water Pump	78 @ 10m	**106**
Power Pack	68 @ 10m	**96**
Compressor	65 @ 10m	**93**
Generator	74 @ 10m	**102**
Wheeled Excavator/Loader	76 @ 10m	**104**
Dump Truck	79 @ 10m	**107**
Grader	74 @ 10m	**102**
High Reach Excavator	78 @ 10m	**106**
Demolition Excavators with pulveriser	80 @ 10m	**108**
Demolition Excavators with hydraulic breaker	82 @ 10m	**110**
Telehandler	71 @ 10m	**99**
MEWPS	67 @ 10m	**95**
Hand-Held Circular Saw	81 @ 10m	**109**
Hand-Held Breaker	83 @ 10m	**111**
Angle Grinders	80 @ 10m	**107**
Skip Lorries	78 @ 10m	**106**
HGV Movement	75 @ 10m	**103**

Appendix 7.7 – Vibration Technical Terms

VIBRATION TECHNICAL TERMS

Ground Borne Vibrations

For any source of vibration on or near the surface of the ground, energy propagates away from the source via:

a) Elastic body (or compression) waves – which radiate energy into the ground in all directions
b) Surface (or shear) waves – which carry energy along the ground surface, caused when body waves are reflected back into the ground at the ground-surface interface

Thus, at any point away from that source, the ground motion is the sum of all the wave motions at that point. When wave motion has been generated, the waves will be attenuated as they travel away from the source. The two main mechanisms for attenuation are:

a) Enlargement of the wavefront as the distance from the source increases, and
b) Internal damping of the transmitting medium (the ground)

Ground borne vibration is therefore made up of a combination of different waves, travelling in different directions, at different speeds and at different frequencies. The frequency component of the vibration will affect the rate at which attenuation occurs since the internal damping of the ground is frequency dependent.

Since vibration enters buildings through the foundations, the hard structure of the building is normally affected to a greater degree than by air borne vibration. Often ground borne vibrations are more noticeable when standing or sitting near the middle of suspended wooden floors.

Ground Borne Vibration Measurement Units

Ground borne vibration is caused when the individual particles making up the strata are caused to oscillate by the passage of a pressure wave. The resulting vibration can be summarized in terms of 4 main parameters:

a) **Velocity** – how fast the particles move when they are oscillating. Since the velocity of these particles continually change as the pressure wave passes the most useful value that is often reported is the maximum or peak particle velocity (PPV). PPVs are usually expressed in terms of ms^{-1} or mms^{-1}.

b) **Acceleration** – is the rate at which the particle velocity changes during oscillation. It is usually measured in ms^{-2} mms^{-2} or “g’s”. 1g is that acceleration imparted to an object by the earth’s gravitational pull and is approximately 9.81 ms^{-2}.

c) **Displacement** – is the distance moved by oscillating particles. This is usually very small and measured in mm or even µm.

d) **Frequency** – is the number of oscillations per second which a particle undergoes due to the passage of a vibration wave. It is measured in cycles per second or Hertz (Hz).

The movement of particles induced to oscillate by vibration waves are usually measured in three mutually perpendicular directions to fully describe the vibration intensity, as particles will be oscillating in three dimensions. These are:

a) **Longitudinal** – back and forth particle movement in the same direction that the vibration wave is travelling.

b) **Vertical** – up and down movement perpendicular to the direction the vibration wave is travelling.

c) **Transverse** – left and right particle movement perpendicular to the direction the vibration wave is travelling.

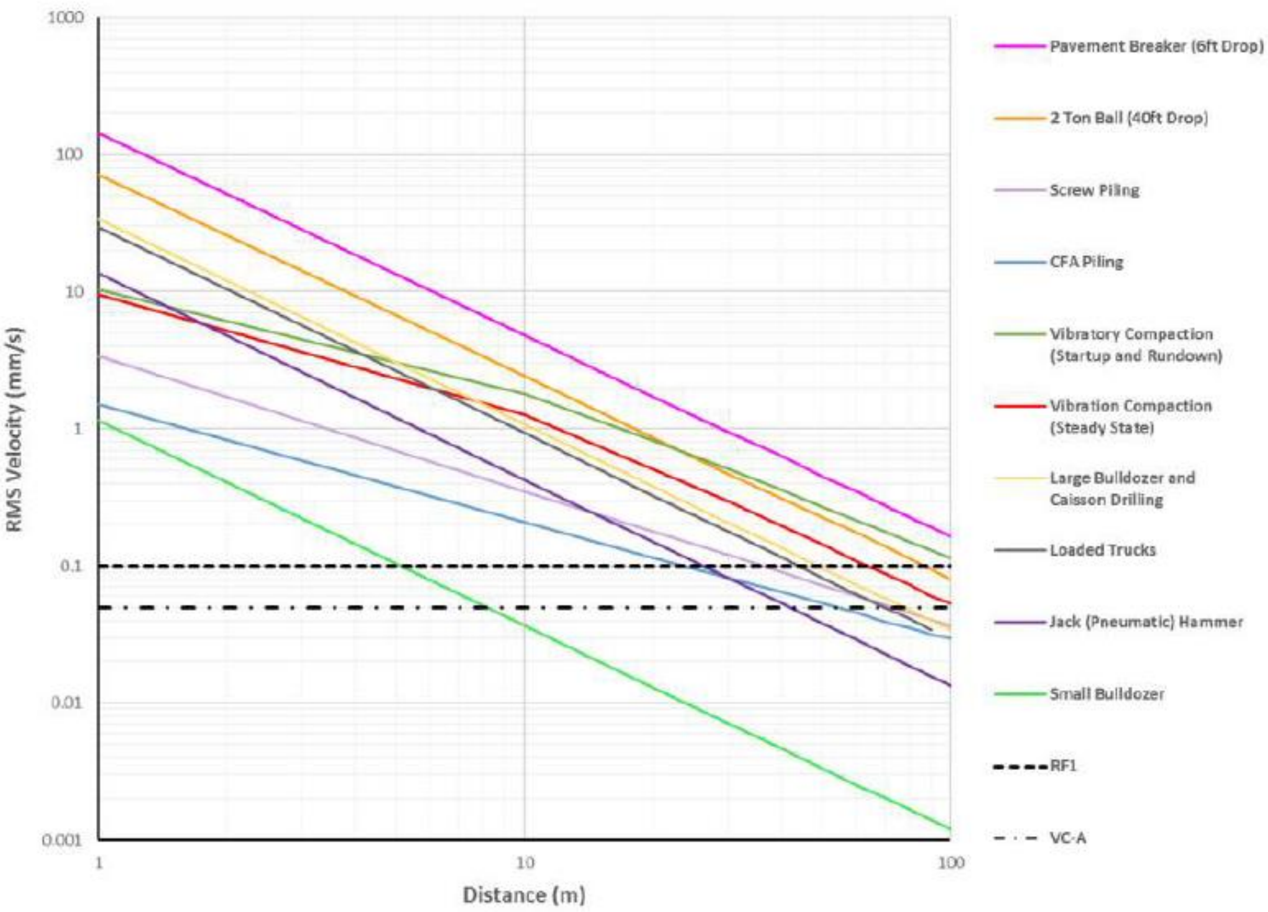
Appendix 7.8 – Typical Vibration Levels from Construction Plant Activities

TYPICAL VIBRATION LEVELS FROM CONSTRUCTION PLANT

Research Data

The New Zealand Transport Agency published a research paper entitled `Ground Vibration from Road Construction' in May 2012, which includes a table of measured PPV values for different types of plant. The results have been provided below as an extract from the paper for ease of reference.

Vibration Levels from a Range of Construction Activities



Hillhouse IBA Facility

Environmental Statement

Chapter 8.0 – Air Quality

Prepared for

Fortis IBA Ltd

July 2024
3566-01-ES-08

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8.0 AIR QUALITY

8.1 Introduction

8.1.1 This Chapter considers the potential impacts of the Proposed Development on air quality. The assessment includes consideration of impact of vehicle and dust emissions during the construction and operational phases of the Proposed Development, and the consequent effects on the environment. Where potential likely significant effects are identified, suitable mitigation measures are proposed. Odour is not normally considered to be an issue for IBA so has not been considered in this assessment. The location of the Proposed Development is shown on Figure 8.1.

Competence

8.1.2 This Chapter and supporting technical appendices have been prepared by Stuart Nock and reviewed by Rosalind Flavell of Fichtner Consulting Engineers Ltd. Stuart (CSci, MIEnvSc, MIAQM) is a Chartered Scientist and member of the Institute of Air Quality Management (IAQM) and the Institute of Environmental Sciences (IES) and has over seven years of experience undertaking air quality assessments for Environmental Impact Assessments (EIAs). Rosalind (CEnv, CSci, MIAQM, MIEnvSc, PIEMA) is a Chartered Scientist and Environmentalist and member of the IAQM and IES and a practitioner member of the Institute of Environmental Management and Assessment (IEMA) and has over fifteen years of experience undertaking air quality assessments for planning and permitting purposes for a wide range of developments across the UK.

8.2 Methodology

Legislation and Guidance

Industrial Pollution Control

8.2.1 Atmospheric emissions from industrial processes are controlled in England through the Environmental Permitting (England and Wales) Regulations (2016) (and subsequent amendments). The operation of an IBA processing facility is included within the Regulations and as such the IBA facility (which forms the Proposed Development) is required to obtain an Environmental Permit (EP) issued by the Environment Agency (EA). No point source emissions to air will be permitted under the conditions of the EP.

National Planning Policy

8.2.2 The National Planning Policy Framework (NPPF), last revised in December 2023, notes that planning policies should sustain compliance with and contribute towards meeting relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas (AQMAs), Clean Air Zones, and the cumulative impacts on air quality from individual sites in local areas. It also states that any new development in an AQMA must be consistent with the local Air Quality Action Plan (AQAP).

8.2.3 In terms of planning decisions and air quality, the NPPF states:

"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." (Paragraph 191).

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan." (Paragraph 192).

8.2.4 National Planning Practice Guidance (NPPG) Air Quality was published in March 2014 and was updated in November 2019. This was developed in order to support the NPPF. The guidance provides a concise outline as to how air quality should be considered in order to comply with the NPPF and states when air quality is considered relevant to a planning application, which includes when the proposals:

- *"Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing* *traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads…;*

- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; or extraction systems (including chimneys) which require approval under pollution control legislation or biomass boilers or biomass-fuelled Combined Heat and Power (CHP) plant; centralised boilers or CHP plant burning other fuels within or close to an AQMA or introduce relevant combustion within a Smoke Control Area'; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;*
- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, workplaces or other development in places with poor air quality;*
- *Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations;*
- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."*

Local Planning Policy

8.2.5 The Proposed Development is located in Wyre Borough Council's (WBC's) administrative area. WBC's adopted Local Plan covers 2011 – 2031. Policy CDMP1 'Environmental Protection' states:

"Development will be permitted where… …it can be demonstrated that the development:

i) Will not give rise to a deterioration of air quality in a defined AQMA or result in the declaration of a new AQMA. Where appropriate an air quality impact assessment will be required to support development proposals.

ii) Where development will result in, or contribute to, a deterioration in air quality, permission will only be granted where any such harm caused is significantly and demonstrably outweighed by other planning considerations and appropriate mitigation measures are provided to minimise any such harm."

8.2.6 This assessment has been undertaken to demonstrate the impact on the local area in accordance with the policies detailed above.

Ambient Air Quality Legislation

8.2.7 In the UK, Ambient Air Directive (AAD) Limit Values, Targets, and air quality standards and objectives for major pollutants are described in the Air Quality Strategy (AQS). In addition, the EA include Environmental Assessment Levels (EALs) for other pollutants in the environmental management guidance 'Air Emissions Risk Assessment for your Environmental Permit' ("Air Emissions Guidance"), which are also considered. The long-term and short-term EALs from these documents have been used when the AQS does not contain relevant objectives. Standards and objectives for the protection of sensitive ecosystems and habitats are also contained within the Air Emissions Guidance and the Air Pollution Information System (APIS).

8.2.8 AAD Target and Limit Values, AQS Objectives, and EALs are set at levels below which significant adverse health effects have been observed in the general population and in particularly sensitive groups. For the remainder of this chapter these are collectively referred to as AQALs. Table 8.1 and Table 8.2 summarise the air quality objectives and guidelines relevant to the pollutants assessed in this assessment.

Table 8.1 – Air Quality Assessment Levels (AQALs)

<table>
<tr><th>Pollutant</th><th>AQAL (µg/m³)</th><th>Averaging Period</th><th>Frequency of Exceedances</th><th>Source</th></tr>
<tr><td rowspan="2">Nitrogen dioxide</td><td>200</td><td>1 hour</td><td>18 times per year (99.79th percentile)</td><td>AAD Limit Value</td></tr>
<tr><td>40</td><td>Annual</td><td>-</td><td>AAD Limit Value</td></tr>
<tr><td rowspan="2">Particulate matter (PM_{10})</td><td>50</td><td>24 hours</td><td>35 times per year (90.41st percentile)</td><td>AQS Objective</td></tr>
<tr><td>40</td><td>Annual</td><td>-</td><td>AQS Objective</td></tr>
<tr><td rowspan="2">Particulate matter ($PM_{2.5}$)</td><td>20</td><td>Annual</td><td>-</td><td>AQS Objective</td></tr>
<tr><td>10</td><td>Annual</td><td>-</td><td>Environment Act Target (2040)*</td></tr>
<tr><td colspan="5">Note:
*The $PM_{2.5}$ AQ Target of 10 µg/m³ was introduced following the Environment Act 2021. This is to be met by 2040. The target has been included in the assessment for completeness.</td></tr>
</table>

Table 8.2 – Critical Levels for the Protection of Vegetation and Ecosystems

Pollutant	Concentration (µg/m³)	Measured as	Source
Nitrogen oxides	75/200*	Daily mean	Air Emissions Guidance / APIS

(as nitrogen dioxide)	30	Annual mean	AAD Critical Level
Ammonia	10	Annual mean where lichens and bryophytes are an important part of the ecosystem's integrity	Air Emissions Guidance / APIS
	20	Annual mean for all higher plants	AAD Critical Level
Notes: **only for detailed assessments where the ozone is below the AOT40 Critical Level and sulphur dioxide is below the lower Critical Level of 10 µg/m^3.* *The AOT40 for ozone is 3,000 ppb.h (6,000 µg/m^3.h) calculated from accumulated hourly ozone concentrations – AOT40 means the sum of the difference between each hourly daytime (08:00 to 20:00 Central European Time, CET) ozone concentration greater than 80 µg/m^3 (40 ppb) and 80 µg/m^3, for the period between 01 May and 31 July.*			

Areas of Relevant Exposure

8.2.9 Local Air Quality Management Technical Guidance (2022), referred to as LAQM (TG22), outlines that the AQALs apply in the following locations:

- Annual mean - all locations where members of the public might be regularly exposed - i.e. building facades of residential properties, schools, hospitals, care homes etc.
- 24-hour mean - all locations where the annual mean objective would apply together with hotels and gardens of residential properties.
- 1-hour mean - all locations where the annual mean, and 24-hour mean apply together with kerbside sites and any areas where members of the public might be reasonably expected to spend one hour or more.

8.2.10 In addition to the Critical Levels set out in the table above, the Air Pollution Information System (APIS) provides habitat specific Critical Loads for nitrogen and acid deposition. Full details of the habitat specific Critical Loads can be found in Appendix 8.4.

Local Air Quality Management

8.2.11 Under Section 82 of the Environment Act (1995) (Part IV), local authorities are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves assessing present and likely future ambient pollutant concentrations against AQALs. If it is predicted that levels at the façade of buildings where members of the public are regularly present (normally residential properties) are likely to be exceeded, the local authority is required to declare an AQMA. For each AQMA, the local authority is required to produce an AQAP, the objective of which is to reduce pollutant levels in pursuit of the relevant AQALs.

8.2.12 A review of the local area shows that the closest AQMA is the Chapel Street AQMA in Poulton-Le-Fylde, located approximately 4 km south of the Proposed Development, which has been declared due to concern over annual mean concentrations of nitrogen dioxide. At this distance no direct effects from construction and operation on air quality in the AQMA are anticipated. Furthermore, no vehicle trips generated by the Proposed Development would travel through the AQMA. Therefore, no further consideration has been given to the air quality impact in the Chapel Street AQMA.

Scope of Assessment

8.2.13 No scoping has been undertaken directly with consultees. An EIA Screening Request was submitted to Lancashire County Council (LCC) (as the planning authority for waste planning applications) in January 2024. An EIA Screening Opinion was provided by LCC dated 26 March 2024 which considered that potential effects would trigger the requirement for an EIA. Pre-application engagement with LCC was also undertaken via a pre-application advice request, to which LCC provided a written response on 22 March 2024.

8.2.14 The assessment contained within this chapter of the ES has been undertaken in accordance with the scope and methodology outlined in the submitted Screening Request and pre-application advice request, and the Screening Opinion and pre-application advice issued by LCC.

8.2.15 The following items have been included in the scope of the assessment:

i) Dust and vehicle emissions during the construction phase of the Proposed Development; and
ii) Dust and vehicle emissions during the operational phase of the Proposed Development.

Assessment Methodology

Construction Phase Dust Emissions

8.2.16 There is the potential for dust to be released into the atmosphere as a result of construction phase activities. These fugitive dust emissions have been assessed on a qualitative basis in accordance with the methodology outlined within the 2024 IAQM document 'Guidance on the assessment of dust from demolition and construction'. This guidance sets out the methodology for assessing the air quality impacts of the construction phase and identifies good practice for mitigating and managing air quality impacts. The quantity of dust emitted will be related to the area of land being worked and the nature, magnitude and duration of construction activities.

8.2.17 The assessment methodology is based on the risk of a construction site giving rise to dust impacts and the sensitivity of the surrounding area. Activities are divided into four types to reflect their different potential impacts. These are:

i) demolition;
ii) earthworks;
iii) construction; and
iv) trackout.

8.2.18 Trackout is a less well-known term. It is defined by the IAQM as: "*The transportation of dust and materials on the wheels of vehicles.*"

8.2.19 The assessment methodology considers three separate dust effects:

i) annoyance due to dust soiling;
ii) harm to ecological receptors; and
iii) the risk of health effects due to significant increase in exposure to PM_{10} (particulate matter with a diameter less than 10 µm).

8.2.20 Full details of the construction phase assessment methodology are presented in Appendix 8.2.

Operational Phase Dust Emissions

8.2.21 There is the potential for dust emissions due to the storage and handling of IBA during the operational phase. There is no guidance specific to assessing these activities. The methodology detailed in the 2016 IAQM document 'Guidance on the Assessment of Mineral Dust Impacts for Planning', which has been developed for the assessment of dust impacts from quarrying and mining, has been adapted to allow an assessment of operational phase dust emissions.

8.2.22 Full details of the construction phase assessment methodology are presented in Appendix 8.3.

Construction and Operational Phase Vehicle Emissions

8.2.23 The 2017 IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality V1.2' (the IAQM 2017 guidance), states that an air quality assessment is required where a development would cause a *"significant change"* in light duty vehicles (LDVs) or heavy goods vehicles (HGV). The indicative criteria to process to an assessment are:

- A change in LDV flows of:
  - more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA; or
  - more than 500 AADT elsewhere.
- A change in HGV flows of:
  - more than 25 AADT within or adjacent to an AQMA; or
  - more than 100 AADT elsewhere.

8.2.24 The IAQM guidance does not clearly state the level of assessment which is required. However, if the change in LDV and HGV flows does not exceed the above criteria, the development is not expected to cause a significant change in vehicle numbers and the significance of effect is deemed to be 'negligible' and further detailed analysis of the impact will not be carried out. For road links where the above criteria are not met, the ADMS Roads dispersion model has been used to quantify the impact of road vehicle emissions on the local environment. Full details of the dispersion modelling methodology can be found in Appendix 8.4. A visual representation of the vehicle emissions modelling domain is shown in Figure 8.2.

Assessment of Significance / Assessment Criteria

Construction Phase Dust Emissions

8.2.25 The IAQM 2024 construction dust guidance is intended to allow the assessor to determine the risk of dust impacts. The assessment criteria are presented in Appendix 8.2. The guidance is not intended to result in an assessment of significance; instead, the outcome of the assessment is the recommendation of suitable mitigation measures to ensure that there will be no significant effects.

Operational Phase Dust Emissions

8.2.26 The IAQM 2016 guidance on dust emissions from minerals sites includes a set of assessment criteria, which are presented in Appendix 8.3. This uses the source-pathway-receptor concept to define the magnitude of dust impacts due to dust disamenity, i.e. dust soiling, and impacts on human health and ecology.

8.2.27 Impacts on human health are to be assessed where baseline annual mean concentrations of PM_{10} are greater than or equal to 17 µg/m³, on the basis that the resulting overall annual mean concentration is unlikely to exceed 32 µg/m³, which is the threshold at which the daily mean AQAL may be exceeded.

8.2.28 Impacts on ecologically sensitive receptors are to be assessed where there is an ecological receptor within the relevant screening distances.

8.2.29 The risk of dust impacts is based on the magnitude of the source and the effectiveness of the pathway. The risk of dust impacts is then combined with the receptor sensitivity to define the significance of the effect, in accordance with the following matrix which has been adapted to use the term 'impact' rather than 'effect' which is the term used in the guidance, but is inconsistent in its use with the rest of this EIA:

Table 8.3 – IAQM Operational Dust Impact Magnitude Descriptors

Risk of dust impacts	Receptor sensitivity		
	Low	Medium	High
High risk	Slight adverse	Moderate adverse	Substantial adverse
Medium risk	Negligible	Slight adverse	Moderate adverse
Low risk	Negligible	Negligible	Slight adverse
Negligible risk	Negligible	Negligible	Negligible

8.2.30 The magnitude of the impact at individual receptors is assessed in accordance with the criteria in Table 8.3. This takes into account any local/site-specific factors and the dust control measures in place as part of the design of the Proposed Development. The magnitude and extent of the individual impacts at receptor locations is then assessed to determine the overall effect from dust deposition on the surrounding area. A conclusion is then reached as to whether the overall effect is 'significant' or 'not significant'.

8.2.31 Where the effect is 'not significant', it is considered that the proposed control measures are sufficient. If the effect is assessed as 'significant', additional mitigation will be required to reduce the impacts to a 'not significant' level.

Vehicle Emissions - Human Health

8.2.32 The IAQM (2017) guidance provides professionals operating within the planning system with a means of reaching sound decisions, having regard to the air quality implications of development proposals on human health. The IAQM (2017) guidance includes the following matrix which should be used to describe the impact based on the change in concentration relative to the AQAL and the overall predicted concentration with the scheme - i.e. the future baseline plus the process contribution.

Table 8.4 – IAQM Magnitude of Change Descriptors

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

8.2.33 It is intended that the change in concentration relative to the AQAL (the process contribution) is rounded to the nearest whole number. Therefore, any impact which is between 0.5% and 1.5% would be classified as a 1% change in concentration. An impact of less than 0.5% is described as negligible, irrespective of the total concentration.

8.2.34 The above matrix is only designed to be used with annual mean concentrations. The approach for assessing the impact of short-term emissions has been carried out in line with the IAQM 2017 guidance. This does not take into account the background concentrations as it is noted that background concentrations are less important in determining the severity of impact for short term concentrations. Consequently, for short term concentrations (i.e. those averaged over a period of an hour or less), the following descriptors of change are used to describe the impact:

- < 10% - negligible;
- 10 - 20% - slight;
- 20 - 50% - moderate; and
- 50% - substantial.

8.2.35 Following quantification of the magnitude of change the assessor should determine the significance of effect using professional judgement and should take into account such factors as:

i) The existing and future air quality in the absence of the development;

ii) The extent of current and future population exposure to the impacts; and

iii) The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

8.2.36 The IAQM 2017 guidance states that, in relation to the significance of short-term impacts: *"In most cases, the assessment of impact severity for a proposed development will be governed by the long-term exposure experienced by receptors and it will not be a necessity to define the significance of effects by reference to short-term impacts. The severity of the impact will be substantial when there is a risk that the relevant AQAL for short-term concentrations is approached through the presence of the new source, taking into account the contribution of other prominent local sources."*

8.2.37 Therefore, if a short-term impact cannot be screened out as 'negligible', consideration will be given to the risk of exceeding the short-term AQAL when determining the significance of effect.

8.2.38 The IAQM 2017 guidance does not provide any descriptors for averaging periods of between 1 hour and a year. Therefore, for these periods, the Air Emissions Guidance criteria have been used, which state that process contributions can be considered 'insignificant' if:

- The long-term process contribution is <1% of the long-term environmental standard; and
- the short-term process contribution is <10% of the short-term environmental standard.

8.2.39 Where an impact cannot be screened out as 'negligible' or 'insignificant' based on the outputs of the initial screening and modelling, the significance of the effect has been determined based on professional scientific judgement of the magnitude and likelihood of emissions causing an exceedance of an AQAL. This is a standard approach which allows the risk and likelihood of exceedance to be investigated and assessed in detail, following the first stage assessment.

Vehicle Emissions - Ecological Effects

8.2.40 In May 2020, the IAQM released the guidance document 'A guide to the assessment of air quality impacts on designated nature conservation sites' (the IAQM 2020 guidance). This guidance draws on the Air Emissions Guidance, which states that to screen out impacts as 'insignificant' at European and UK statutory designated sites:

- the long-term process contribution must be less than 1% of the long-term environmental standard (i.e., the Critical Level or Load); and
- the short-term process contribution must be less than 10% of the short-term environmental standard.

8.2.41 In accordance with the Air Emissions Guidance, calculation of the PEC for local nature sites is not required. However, with regard to local nature sites, the IAQM 2020 guidance states: *"For local wildlife sites and ancient woodlands, the Environment Agency uses less stringent criteria in its permitting decisions. Environment Agency policy for its permitting process is that if either the short-term or long-term PC is less than 100% of the critical level or load, they do not require further assessment to support a permit application. In ecological impact assessments of projects and plans, it is, however, normal practice to treat such sites in the same manner as SSSIs and European Sites, although the determination of the significance of an effect may be different. It is difficult to understand how the Environment Agency's approach can provide adequate protection."*

8.2.42 As such, it is considered appropriate to apply the screening criteria for European and UK designated sites to local nature sites to screen out the requirement for further consideration of the significance of effect for planning.

8.2.43 The IAQM 2020 guidance further states that *"the 1% [long-term, and, by extension, the 10% short-term] screening criterion is not a threshold of harm and exceeding this threshold does not, of itself, imply damage to a habitat"* and that for impacts that exceed these screening criteria, *"the information should be passed to the ecologist to use their expertise to determine whether or not the is, in fact, a likely significant effect of the project or plan on the habitat."* Therefore, where an impact cannot be screened out as 'insignificant', further assessment is to be undertaken by a qualified ecologist to determine the significance of effect.

Limitations

8.2.44 The assessment is subject to the following limitations:

- Uncertainties in dispersion modelling inputs, such as weather data and vehicle numbers for the modelling of vehicle emissions, along with inherent uncertainties in the dispersion modelling results;

- Uncertainty in baseline pollutant concentrations;
- Subjective judgments are required for the qualitative assessment of dust impacts; and
- There is no guidance specific to the assessment of operational phase dust impacts from the storage and processing of IBA.

8.2.45 These limitations have been accounted for wherever possible. For example:

- The assessment has been undertaken using standard methods outlined in guidance produced by the EA and the IAQM. Standard assessment criteria, developed by nationally recognised institutions, minimise any uncertainty on the applicability of the approach used.
- Baseline data has been collected from local and national monitoring networks. Where local monitoring is not available, worst-case assumptions have been made, and if impacts cannot be screened out as 'negligible' irrespective of the total concentration or 'insignificant' when determining the significance of effect, then the choice of baseline concentrations has been considered in greater detail.
- Where the methodology requires a subjective judgment or assumption, the most conservative option has been used in the first instance.
- The modelling of vehicle emissions has been verified against monitoring data to minimise uncertainty and demonstrate that the model is simulating actual conditions.
- The IAQM guidance for the assessment dust impacts from minerals sites (such as mines and quarries) has been adapted for use in the assessment of operational phase dust impacts.

8.2.46 Taking the above into account, although there are uncertainties and limitations inherent in the assessment methodology, the conservative assumptions built into the assessment are sufficient to ensure that the predicted results are far more likely to be an over-estimate of the likely impact of the Proposed Development rather than an under-estimate.

8.3 Baseline

8.3.1 A review of baseline conditions is provided in Appendix 8.1. This has included a review of local and national monitoring networks.

8.3.2 Local monitoring has been used to determine baseline pollutant concentrations where this available and is representative of concentrations in the vicinity of the Proposed Development. For certain pollutants there is no local monitoring data available. In lieu of representative location monitoring, concentrations obtained from national monitoring datasets or Defra mapped background datasets have been used as the baseline concentrations in the assessment. Baseline concentrations do not exceed the AQAL for any pollutants.

Future Baseline

8.3.3 Generally, in the UK atmospheric pollutant concentrations are either remaining constant or decreasing with time. Whilst not a ‘natural change’, government projections indicate that atmospheric pollutant concentrations are likely to reduce in future as a result of national policies to reduce emissions over time, with the possible exception of ammonia for which the trend is uncertain but may be slightly increasing. As such, it is likely that most pollutant concentrations in the vicinity of the Site will decrease over time if the Proposed Development is not built. This decrease in baseline concentrations would also occur if the Proposed Development were built. Defra’s mapped background datasets include projections of pollutant concentrations in future years which have been used in the assessment.

8.3.4 In addition, traffic generated by schemes which are consented but not yet operational has been included in the dispersion modelling assessment. The following committed developments have been included:

- 19/00347/FULMAJ – Thornton Cleveleys Football Club;
- 20/00405/LMAJ – 210 dwellings off Bourne Road; and
- LCC/2023/0003 – Thornton Energy Recovery Centre (TERC).

8.3.5 The TERC, which has planning consent, will also include point source emissions. The Air Quality EIA submitted with the planning application for the TERC showed that the point source emissions would result a small incremental increase in pollutant concentrations. The future baseline has been assessed giving consideration to stack emissions from the TERC, where appropriate.

Sensitive Receptors

Dust Sensitive Receptors

8.3.6 It is anticipated that dust generating construction activities would take place at various locations across the Site. However, as a worst-case assumption, it has been assumed that dust generating activities would occur up to the boundary of the Site. Figure 8.3 (Construction Dust Screening Distances) illustrates the screening distances for dust sensitive receptors from the boundary of the Site. The IAQM guidance for construction dust includes a maximum screening distance of 250 m; the IAQM guidance for operational mineral dust sites gives screening distances for 400 m for 'hard rock' and 250 m for 'soft rock'. This guidance is for mining and quarrying and has been adapted for use in this assessment. Dust generation from the operation of the Proposed Development is anticipated to be considerably less than a mining or quarrying operation, so the 250 m screening distance has been applied which is considered to be a conservative approach given the nature of the development.

8.3.7 The only high-sensitivity human receptors identified within the maximum screening distance (250 m) of where dust-generating activities may occur are the caravans in the holiday park to the south-east of the Site. The closest of these lies approximately 35 m from the Site boundary. The Wyre Way footpath passes approximately 25 m from the Site boundary at the closest point. This is considered to be a low sensitivity receptor for dust soiling and human health effects.

8.3.8 The closest ecological receptor is within 50 m of the Site boundary, and has overlapping designations as the Morecambe Bay Ramsar site, Morecambe Bay and Duddon Estuary Special Protection Area (SPA), and the Wyre Estuary Site of Special Scientific Interest (SSSI). This lies approximately 45 m from the Site boundary at the closest point. Due to its European designation this is considered to be of high sensitivity.

Vehicle Emissions Sensitive Receptors

8.3.9 A selection of local human sensitive receptors (residential dwellings) have been identified along roads which will be affected by the traffic generated by the Proposed Development.

8.3.10 With regard to ecological sensitive receptors, the Design Manual for Roads and Bridges (DMRB) note LA 105 (Air Quality) states that air quality impacts of a project require an assessment if the number of vehicles generated is >1,000 LDVs or >200 HGVs on an AADT basis, and there are sensitive receptors within 200 m of the affected roads. The Proposed Development will generate 166 HGVs on an AADT basis. The site access road lies within 200 m of the Morecambe Bay Ramsar site/

Morecambe Bay and Duddon Estuary SPA/ Wyre Estuary SSSI. Although the trip generation is slightly below the screening criteria, the impact of vehicle emissions at this overlapping ecological designation has been assessed for completeness. The only other ecological site identified within the relevant screening distance of the affected road network is the Fleetwood Railway Branch Line Trunnah to Burn Naze Biological Habitat Site, over which the access road to the Proposed Development passes on a bridge.

8.3.11 The receptor locations are displayed in Figure 8.2 (Vehicle Emissions Modelling domain) and are listed in the following table. The human receptors have been modelled at a height of 1.5 m to represent typical breathing height while ecological receptors have been modelled at ground level.

Table 8.5 – Sensitive Receptors

ID	Receptor Name	Location	
		X	Y
R1	31 Dallam Bell	333669	444079
R2	29 Rixton Grove	333547	444013
R3	24 Rose Fold	333428	443988
R4	Alder Lane 1	333662	444109
R5	43 Dallam Bell	333736	444102
R6	Alder Lane 2	333705	444140
R7	Willow Road	333823	444119
R8	2 Fleetwood Road North	333380	443934
R9	1 Edward Street	334007	443879
R10	Land at Bourne Road 1	333924	444008
R11	Land at Bourne Road 2	334033	443949
R12	7 Mallowdale	333438	443868
R13	1 Rippingdale Way	333409	443823
R14	12 The Covert	332933	443767
R15	22 Curlew Close	333047	443871
R16	21 Berwick Ave	332794	443743
R17	46 Croasdale Drive	332859	443501
R18	171 West Drive	332927	443411
R19	156 West Drive	332864	443370
R10	5 Eversleigh Avenue	332913	443336
R21	7 Rosemary Avenue	332866	443319
R22	Roscoe Terrace	334620	442958
E1	Morecambe Bay Ramsar site/ Morecambe Bay and Duddon Estuary SPA/ Wyre Estuary SSSI	335010	443533
E2	Fleetwood Railway Branch Line Trunnah to Burn Naze Biological Habitat Site	334112	443812

8.4 Assessment of Effects

Embedded Mitigation

8.4.1 The Proposed Development will require an Environmental Permit to operate, which will include a list of operating techniques including:

- All ash separation and screening processes shall take place inside a building;
- Where open outdoor storage is used, one or a combination of the following measures should be employed:
  - moistening the surface using water
  - providing undercover storage.

8.4.2 As such, all ash processing (i.e. screening and crushing) will be undertaken within a mostly enclosed building, albeit with a gap around 2.4 m height to allow metals skips to be freely moved into and out of the building (refer to proposed elevation drawings submitted with this application). The storage of IBA (the raw material) and IBAA (the product resulting from the IBA process) will be undertaken within a three-sided building and the IBA stockpiles will be sprayed with water to minimise fugitive dust emissions.

8.4.3 The Proposed Development will be subject to a Dust Management Plan (DMP) which will include more detailed techniques to minimise operational phase dust emissions, including a wheel wash system for HGVs departing the Site.

Construction Phase

8.4.4 Potential air quality impacts during the construction phase have been identified as:

- generation of dust from construction activities, which has been assessed on a qualitative basis; and
- generation of exhaust pollutants from construction phase traffic, which has been assessed on a qualitative basis.

Generation of Dust from Construction Activities

8.4.5 The risk of dust emissions from a construction site causing loss of amenity and / or health or ecological effects is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activities;
- The size of the site;

- The meteorological conditions (wind speed and direction, and rainfall);
- The proximity of receptors to the activity;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

8.4.6 The quantity of dust emitted is related to the area of land being worked and the level of construction activities, in terms of the nature, magnitude and duration of those activities. The wind direction, wind speed and rainfall at the time when a construction activity is taking place will also influence whether there is likely to be any dust impacts. Atmospheric conditions which promote adverse impacts can occur in any direction from the Proposed Development. However, adverse impacts are more likely to occur downwind of the prevailing wind direction and / or close to the worked areas. Impacts are also more likely to occur during drier periods as rainfall acts as a natural dust suppressant.

8.4.7 An assessment of dust emissions during the construction phase of the Proposed Development has been undertaken in accordance with the methodology detailed in Appendix 8.2.

8.4.8 The dust emission magnitude for each construction phase activity has been classified using the IAQM criteria outlined in Table 1 of Appendix 8.2:

- Demolition – demolition of all but one of the buildings previously on Site has already been completed under a separate planning consent. A single-storey office building is to be demolished, with a footprint of approximately 35 m x 15 m and total volume < 12,000 m^3. The dust emission magnitude is deemed to be 'small'.
- Earthworks - The total area where ground preparation works will take place is >110,000 m^2. The quantity of material to be moved is yet to be determined. However, based on the size of the Site, the dust emission magnitude is conservatively deemed to be 'large'.
- Construction - The total building volume is likely to be >75,000m^3 and involve potentially dusty activities. As a conservative assumption, the dust emission magnitude is deemed to be 'large'.
- Trackout – the number of HGV movements during the construction phase is expected to be 32 two-way vehicle movements per day, i.e. 16 outward HGV

movements per day. On this basis, the dust emission magnitude is deemed to be 'medium'.

8.4.9 The sensitivity of the area to dust effects is defined in the following table, taking into account the number of receptors and proximity to the source of potential dust emissions using the criteria outlined in Table 2 to Table 7 of Appendix 8.2.

Table 8.6 – Sensitivity of the Surrounding Area to Dust Emissions

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust soiling	Low	Low	Low	Low
Human health	Low	Low	Low	Low
Ecology	Medium	Medium	Medium	-

8.4.10 The sensitivity of the surrounding area has been determined based on the following factors.

Dust Soiling

8.4.11 There are no high sensitivity receptors within 50 m of the Site boundary and fewer than 10 high sensitivity receptors within 100 m of the Site boundary. Therefore, the sensitivity of the area to dust soiling from demolition, earthworks and construction activities is assessed as "low".

8.4.12 There are fewer than 10 high sensitivity receptors within 50 m of the roads where trackout may occur, up to 250 m from the Site entrance. Therefore, the sensitivity of the area to dust soiling from trackout is assessed as "low".

Human Health Impacts

8.4.13 The sensitivity of the area to human health impacts from demolition, earthworks and construction activities is assessed as "low", as the baseline concentration of PM_{10} is less than 24 µg/m³ (as detailed in Appendix 8.1) and there are no high sensitivity receptors within 20 m of the Site boundary or within 20 m of the roads where trackout may occur.

Ecological Impacts

8.4.14 The sensitivity of the area to ecological impacts of dust has been carefully considered. The only ecological receptor requiring inclusion in the assessment is E1 (refer to Table 8.5) (Morecambe Bay Ramsar site/ Morecambe Bay and Duddon Estuary SPA/ Wyre Estuary SSSI). This receptor lies within 50 m of the Site boundary at the closest point, . The sensitive habitat in this area, coastal saltmarsh, is present up to the boundary of the ecological site. Whilst coastal saltmarsh would likely be subject to periodic washing by the tide, the European designation of this receptor results in the receptor conservatively being considered to be of “high” sensitivity.

8.4.15 As this “high” sensitivity ecological receptor lies within 50 m of the Site boundary the sensitivity of the area to ecological impacts from demolition, earthworks and construction has been assessed as “medium”. The receptor lies more than 50 m from the Site access road where trackout may occur; therefore no effects at this receptor due to trackout are anticipated.

8.4.16 The risk of dust impacts as a result of construction activities is summarised in the following table using the criteria outlined in Table 5 of Appendix 8.2. This is based on the dust emission magnitude and the sensitivity of the area.

Table 8.7 – Summary of Dust Risk to Define Site Specific Mitigation

Potential Impact	Demolition	Earthworks	Construction	Trackout
Dust soiling	Negligible Risk	Low Risk	Low Risk	Low Risk
Human health	Negligible Risk	Low Risk	Low Risk	Low Risk
Ecology	Low Risk	Medium Risk	Medium Risk	N/A

8.4.17 In summary, maximum risk of dust impacts has been assessed as “medium risk” for impacts on ecology from earthworks and construction.

8.4.18 Any impacts would be temporary, short term in duration and would only occur during the construction period. Suitable mitigation measures to reduce the impact of dust emissions during the construction phase are included in the mitigation section. With the implementation of these measures any residual effects would be ‘***not significant’***.

Generation of Exhaust Pollutants from Construction Phase Traffic

8.4.19 The number of vehicle movements during the construction phase is expected to be 73 two-way car movements and 32 two-way HGV movements per day, for a total of 105 two-way vehicle movements. This is much less than the 197 two-way AADT staff vehicle and HGV movements during the operational phase, which are also much more heavily weighted to the more polluting HGV movements with 166 HGV two-way AADT movements. The effect of operational phase traffic has been assessed using dispersion modelling (refer to the section on operational phase impacts) and found to be 'negligible'. Therefore, the effect of the lower level of vehicle emissions during the construction phase will also be '***negligible***' and '***not significant***'.

Operational Phase

Operational Phase Dust Emissions

8.4.20 The operational phase dust emissions have been assessed in accordance with the methodology presented in the IAQM 2016 guidance on dust emissions from minerals sites, which is detailed in Appendix 8.3. This has given consideration to the potential magnitude and nature of dust emissions from the Proposed Development in comparison to those from the mining/quarrying activities for which the guidance is intended.

8.4.21 In the first instance, the scope of the assessment is defined. In accordance with the guidance, a detailed assessment of effects on human health is only required if the background PM_{10} concentration exceeds 17 µg/m³, for which the contribution from the largest minerals sites could result in an exceedance of the AQALs for PM_{10}. As detailed in Appendix 8.1, the background PM_{10} concentration at the Site is estimated to be no higher than 9.2 µg/m³. Therefore, no significant effects on human health are expected when considering concentrations of PM_{10}.

8.4.22 Consideration has also been given to the contaminants potentially present in the IBA. The vast majority of the mass of IBA is inert material, such that ash dust would be of similar composition to mineral dust. However, some contaminants from the waste fuel and the combustion process would be present in trace quantities. An analysis of the potential quantities of contaminants in the IBA (taken from monitoring data from a similar facility) and the impact of fugitive emissions has been undertaken and is presented in Appendix 8.5. This shows that the potential emissions of these pollutants would not significantly increase pollutant concentrations. Therefore, effects on human health can be screened out and this assessment focusses on the effect of dust emissions on amenity at human sensitive receptors, and on ecology.

8.4.23 The receptors identified for inclusion in this assessment are the holiday park to the south-east of the site (designated DR1), the Wyre Way footpath (designated DR2), and ecological receptor E1. DR1 and E1 are considered to be 'high sensitivity' due to high expected levels of amenity at DR1, and European ecological designations at E1. As it is a footpath with low levels of expected amenity and transient exposure, DR2 is ‘low sensitivity’. The receptor locations are shown on Figure 8.4.

8.4.24 The prescribed methodology for amenity and ecological effects is the same. Firstly, the residual source emissions (taking into account any control measures) are defined as small, medium or large. The guidance is designed for mineral extraction sites; the Proposed Development would be expected to be inherently less dusty than a quarry or open mine. The IBA would be delivered damp (rather than dry) following quenching at the source facilities, limiting the dust generation potential. Material processing would occur within a four-sided building. Therefore, the main source of dust emissions is the IBA stockpiling, which will take place in a three-sided building, and the loading, unloading and haulage of materials. When considering the activities undertaken and the control measures proposed to reduce dust emissions, the magnitude of the source is considered ‘small’.

8.4.25 The pathway effectiveness towards receptors is then defined, giving consideration to the frequency of winds towards the receptor and any barriers that exist between the source and receptor. A wind rose from Blackpool Airport is presented as Figure 8.5. This shows that the wind blows from the Site towards DR1 (i.e. from the north west) relatively frequently, but towards DR2 and E1 less frequently. While the closest part of DR1 lies <50 m from the Site boundary, this is the distance from the Site entrance and weighbridge area; the receptor is approximately 130 m from the main area of the Site where potentially dust-generating activities would occur. DR2 and E1 are within 50 m of the Site boundary; for these receptors, potentially dust-generating activities will occur at a distance of approximately 50 m.

8.4.26 Due to the distance from the source, the pathway to DR1 is assessed as ‘moderately effective’. DR2 and E1 lie closer to the source, but the wind blows in this direction less frequently. The pathway to DR2 and E1 is also assessed as ‘moderately effective’.

8.4.27 In accordance with Table 1 of Appendix 8.3 the pathway effectiveness and residual source emissions are combined to determine the risk of dust impacts. For a ‘moderately effective’ pathway and ‘small’ residual source emissions, there is a ‘negligible risk’ of dust impacts.

8.4.28 Table 2 of Appendix 8.3 defines the magnitude of the impact by combining the risk of dust impacts and the receptor sensitivity. For receptors of any sensitivity, a 'negligible risk' results in a 'negligible impact'.

8.4.29 Therefore, the impact at all identified receptors is '***negligible***', and the overall effect of operational dust emissions will be ***'not significant'***.

Operational Phase Vehicle Emissions – Human Health

8.4.30 Tables of the contribution from vehicles generated by the operational phase of the Proposed Development to concentrations of nitrogen dioxide and particulate matter at receptor locations are provided in Appendix 8.4. These show that the magnitude of change due to vehicle emissions at all receptors is '***negligible***'.

8.4.31 Defra's LAQM.(TG22) guidance states that the hourly mean AQAL for nitrogen dioxide is unlikely to be exceeded where the annual mean concentration is below 60 $\mu g/m^3$. The PEC is well below the annual mean AQAL of 40 $\mu g/m^3$ at all receptor locations, and as such it is considered that there is no potential for an exceedance of the hourly mean AQAL due to emissions from road vehicles associated with the operation of the Proposed Development.

8.4.32 Defra's LAQM.(TG22) guidance also provides a formula for determining the likely number of exceedances of the daily mean AQAL for PM_{10}. As stated in Table 8.1, 35 exceedances of the daily mean AQAL of 50 $\mu g/m^3$ are permitted per year. Applying the formula taken from LAQM.(TG22) to the maximum predicted annual mean PM_{10} concentration at a receptor of 10.65 $\mu g/m^3$ (which includes the baseline concentration), no exceedances of the daily mean AQAL are predicted due to emissions from road vehicles associated with the operation of the Proposed Development.

Operational Phase Vehicle Emissions – Ecology

8.4.33 The effect of emissions of oxides of nitrogen and ammonia from vehicles has been assessed and the detailed results presented in Appendix 8.4. This shows that the impact of vehicle emissions at E1, the Morecambe Bay Ramsar site/ Morecambe Bay and Duddon Estuary SPA/ Wyre Estuary SSSI, can be screened out as ***'insignificant'.***

8.4.34 Traffic will access the site via Bourne Road and Bourne Street, which passes over the Fleetwood Railway Branch Line Trunnah to Burn Naze BHS on a bridge. The impact at E2, the Fleetwood Railway Branch Line Trunnah to Burn Naze BHS, has been assessed accounting for the height difference between the road and receptors, estimated to be approximately 4 m. As presented in Appendix 8.4 the impact of operational phase vehicle emissions as the Fleetwood Railway Branch Line Trunnah to Burn Naze BHS can be screened out as ***'insignificant'.***

Decommissioning Phase

8.4.35 A detailed decommissioning plan and assessment will be prepared prior to decommissioning of the Proposed Development. The impacts of decommissioning cannot be assessed in detail at this stage, as factors such as best-practice methods and guidance and the sensitivity of the area are very likely to change by the time decommissioning is planned. However, the dust impacts during decommissioning are anticipated to be similar to those during construction. Demolition will be required, which will be undertaken using best-practice means to minimise dust emissions. Similarly to the construction phase, with appropriate control measures the residual impact will be ***'negligible'*** and the effect ***'not significant'.***

8.4.36 Regarding vehicle emissions, it is anticipated that all materials can be removed in bulk after demolition. This means that larger payloads can be used during decommissioning compared to construction. Therefore, the traffic flows and associated air quality impact during decommissioning will be lower than during construction, and the impact will be impact will be ***'negligible'*** and the effect ***'not significant'.***

8.5 Cumulative Effects

8.5.1 Three committed development schemes have been identified for inclusion in the assessment:

- *19/00347/FULMAJ – Thornton Cleveleys Football Club;*
- *20/00405/LMAJ – 210 dwellings off Bourne Road; and*
- *LCC/2023/0003 – Thornton Energy Recovery Centre (TERC).*

8.5.2 Five additional schemes have been considered for inclusion in the cumulative assessment, but have been excluded as detailed below:

- *LCC/2022/0056 – New building for the storage of hazardous waste materials, Victrex Plant*. Located immediately north-west of the Site boundary. There are no highly dust sensitive human receptors within 250 m or ecological receptors within 50 m of this development, so construction phase dust impacts can be screened out. There will be no operational phase emissions.
- *23/01099/FUL – Demolition of an existing building and erection of a new building for vehicle repairs and servicing.* Located approximately 960 m north-west of the Site. There is no risk of cumulative dust impacts due to the distance from the Site. The planning application documents do not include any details of traffic generated by the operational phase. However, based on the nature of the development this would not be expected to have a material effect on traffic flows or air quality.
- *22/00762/FULMAJ - 158 dwellings at Bourne Hill off Fleetwood Road North.* As stated in the Transport Statement for the Proposed Development, this development results in some limited additional two-way movements along Bourne Way during the AM and PM peak periods only. Traffic flows associated to this development have not been included in the traffic model analysis. As such, the air quality impact has not been quantified but is expected to be negligible due to the small number of additional vehicle movements on the road network affected by the Proposed Development.
- *22/00672/FUL - to allow the use of the approved holiday caravan park on a year round basis on planning application 3/6/3857.* No trip generation figures were submitted with the planning application so a quantitative assessment cannot be undertaken. LCC Highways' consultation response states "the proposed development will not have a significant impact on highway safety, capacity or amenity in the immediate vicinity of the site".
- *23/01110/LMAJ - 80 dwellings off Lambs Road.* This development is located more than 1 km south of the Site. The study area for the Transport Assessment for this development does not overlap with that for the Proposed Development, but at the closest junction (A585/Victoria Road E) only 16 am and 12 PM peak hour movements are predicted, which is considered to be well within normal daily fluctuations in traffic flow. The trip generation would be even less within the study area for the Proposed Development, so no significant cumulative effects are likely.

8.5.3 In accordance with the IAQM 2017 guidance, the traffic generated by the developments included in the cumulative assessment has been included in the future baseline; therefore the assessment presented in Appendix 8.4 includes the effect of traffic generated by these schemes and no additional cumulative effects are anticipated.

8.5.4 None of the cumulative schemes included for assessment lie within 500 m of the boundary of the Proposed Development, so the dust screening zones (250 m) would not overlap. Therefore, no cumulative construction dust impacts would occur even if the construction phases were to coincide.

8.5.5 The TERC includes stack emissions. Consideration has been given to the potential cumulative impact of the Proposed Development with stack emissions from the TERC. This analysis is presented in Appendix 8.4, and it has been concluded that the inclusion of stack emissions from the TERC would not change the conclusions of the assessment. Therefore, the cumulative effects are ***'negligible'*** and ***'not significant'.***

8.6 Mitigation

Construction Phase

8.6.1 The construction dust assessment has identified the Site as a 'medium risk' site. Appropriate mitigation measures based on best practice for a site of this size and nature will be implemented as follows:

- Display the name and contact details of person(s) accountable for dust issues on the Site boundary. This may be the environment manager/engineer or the Site Manager.
- Display the head or regional office contact information.
- Develop and implement a Construction Dust Management Plan (included in this application).
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emission in a timely manner, and record the measure taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emission, either on- or off- site, and the action taken to resolve the situation in the log book.
- Keep Site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from the Site as soon as possible, unless being re-used on-site. If they are being re-used on-site stockpiles are to be covered or otherwise managed to prevent wind whipping.

- Ensure all on vehicles switch off engines when stationary - no idling vehicles.
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the Site for effective dust / particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- Prohibit bonfires and burning of waste materials.
- Ensure sand and other aggregates are stored in designated areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure vehicles entering and leaving the Site are covered to prevent escape of materials during transport.
- Keep vehicle clean by implementing a wheel washing system to avoid tracking dirt around and off the site.
- Use localised dampening and activity specific dampening to reduce localised emission of dust.
- Minimise stockpiling of material.
- Use water sprays when tipping friable fill material.
- Erect wind breaks around the key construction activities and, if possible, in the vicinity of potentially dusty works.
- Monitor and supervise the civil contractor during construction to verify that dust control measures are being implemented in line with the project's requirements.
- Introduce a speed limit of 10 mph throughout the Site.

8.6.2 The mitigation measures stated above are based on best practice for a site of the size and nature. With the implementation of these measures within the CEMP any residual effects would not be significant.

Operational Phase

8.6.3 The embedded mitigation measures are anticipated to be suitable to minimise dust emissions during the operational phase to an acceptable level.

8.6.4 The embedded operational phase mitigation measures include that all ash processing will be undertaken within a covered four-sided building, that the storage of IBA and IBAA will be undertaken within a three-sided building, and the IBA stockpiles will be sprayed with water to minimise fugitive dust emissions. The Proposed Development will be subject to an EP to operate and will include a Dust Management Plan (DMP) which will include more detailed techniques to minimise dust emissions, including a wheel wash system for HGVs departing the site.

8.6.5 The impact of vehicle emissions has been assessed as negligible. Therefore, no mitigation measures regarding vehicle emissions are required.

8.7 Residual Effects and Conclusions

8.7.1 This air quality impact assessment has considered dust and vehicle emissions during the construction and operational phases of the Proposed Development. Dust emissions have been assessed qualitatively in accordance with best-practice guidance. Vehicle emissions have been quantified using dispersion modelling.

8.7.2 A quantitative assessment of operational phase vehicle emissions has been undertaken, including the contribution to baseline concentrations from general traffic growth, and from the three identified cumulative schemes (see paragraph 8.5.1). This has concluded that the effect of vehicle emissions on human health is predicted to be '***not significant'***. The level of traffic during the construction phase will be less than the operational phase and will also be '***not significant'.*** The cumulative effect including stack emissions from the TERC has also been assessed as '***not significant'.***

8.7.3 Construction phase dust emissions have been assessed and suitable mitigation measures recommended. With the implementation of appropriate mitigation measures the residual effect will be '***not significant***'.

8.7.4 Operational phase dust emissions have been assessed and it has been concluded that the impacts are ***'negligible'*** and the overall effect ***'not significant'.*** Therefore, no additional mitigation measures beyond those included in the design are required.

8.7.5 In conclusion, the Proposed Development is not predicted to give rise to significant environmental effects on air quality.

Hillhouse IBA Facility

Environmental Statement

Chapter 9.0 – Ground Conditions

Prepared for

Fortis IBA Ltd

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CONTENTS

APPENDICES

9.0 GROUND CONDITIONS

9.1 Introduction

9.1.1 This chapter assesses the likely significant impacts and resulting effects of the Proposed Development in the context of ground conditions and ground contamination. The principal aspects considered in this assessment are:

i) Existing ground and groundwater conditions including potential for contamination;
ii) Potential impacts of the Proposed Development on the ground and groundwater conditions, and wider surrounding environment; and,
iii) Potential impacts of the existing ground, groundwater and contamination conditions on the Proposed Development.

9.1.2 This Chapter describes the existing baseline conditions at the Site and surroundings, the potential significance of direct and indirect land impacts of the Proposed Development, and the mitigation measures required to prevent, reduce or offset the impacts and the significance of residual effects.

9.1.3 Baseline information provided within this Chapter is provided within the Phase 1 Geo-Environmental Assessment report (reference: R3217-R01-v3, SGP. June 2024) a copy of which, is contained within ES Appendix 9.1.

9.1.4 The assessment within this Ground Conditions Chapter has comprised a review of third-party information on the environmental setting of the Site and the Site's previous and current uses with respect to potential risks to the environment or human health, and a Site inspection.

9.2 Proposed Development

9.2.1 The Proposed Development is described in detail in Chapter 4.0, the Scheme Description. Aspects of relevance to the ground conditions and ground contamination assessment are:

i) Disturbance and trenching of ground as part of preparatory works;
ii) Construction of buildings on Site; and,
iii) Storage of waste materials (IBA) in the open-air post development which could give rise to contaminated run-off to the nearby Royles Brook.

9.3 Competence

9.3.1 This Chapter has been prepared by Smith Grant LLP (SGP), an environmental consultancy specialising in the risk assessment and remediation of contaminated and derelict land. The consultancy has been in practice for over 30 years and regularly supports planning applications to address and discharge the land contamination associated conditions. The authors both have over 14yrs' experience within the field of contaminated land assessment and are Chartered individuals of professional bodies including the Institute of Environmental Sciences and Chartered Institution of Water and Environmental Management.

9.4 Methodology

Legislation and Guidance

National Planning Policy and Guidance

9.4.1 The assessment has been prepared with reference to the Planning Practice Guidance provided in relation to land affected by contamination and land stability under the National Planning Policy Framework (NPPF) 2023[1].

9.4.2 The NPPF 2023 sets out the Government's planning policies for England and how these are expected to be applied. The Framework provides some general guidance to local authorities on taking land condition into account in planning policies and decisions. Paragraph 180 of the Framework states:

'Planning policies and decisions should contribute to and enhance the natural and local environment by […]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality; and,

[1] Department for Communities and Local Government, (19 February 2019), *National Planning Policy Framework; issued 27 March 2012; last revised 19 December 2023.* [National Planning Policy Framework - Guidance - GOV.UK (www.gov.uk)]

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

9.4.3 The Framework further states in paragraph 189 in relation to Ground Conditions and Pollution that:

'Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation measures including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and,

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

9.4.4 Paragraph 190 of the NPPF framework is also applicable which states:

'Where a site is affected by land contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner'

9.4.5 Further guidance is provided in the Planning Practice Guidance on Land Affected by Contamination[2] (NPPG) which provides guiding principles on how planning can deal with land affected by contamination. The guidance sets out when contamination may be present, the role of planning when dealing with land which may be contaminated, what a contamination risk assessment may contain and how to determine unacceptable risk. The guidance states that where there is a reason to believe contamination could be an issue, proportionate but sufficient site investigation information should be prepared by a competent person to determine the existing or otherwise of contamination.

[2] Department for Communities and Local Government (2014; updated 2019). *Planning Practice Guidance, Land affected by contamination.* *[Land affected by contamination - GOV.UK (www.gov.uk)]*

9.4.6 Further guidance is also provided in the Planning Practice Guidance on Land Stability[2] which provides guiding principles on how planning can deal with land stability. The effects of land instability may result in landslides, subsidence or ground heave. Failing to deal with this issue could cause harm to human health, local property and associated infrastructure, and the wider environment. They occur in different circumstances for different reasons and vary in their predictability and in their effect on development. The guidance sets out steps to be taken when land stability is suspected to be an issue for a planning application, what a land stability risk assessment should be contained and measures to be taken to mitigate the risk of subsidence. The guidance also sets out the role of the Coal Authority in the planning system to prevent land instability.

Local Planning Policy and Guidance

9.4.7 Lancashire County Council is the determining authority. The Development Plan for the Site is made up of the Joint Lancashire Minerals and Waste Development Framework Core Strategy Development Plan Document, the Joint Lancashire Minerals and Waste Local Plan – Site Allocation and Development Management Policies – Part One and the Adopted Wyre Local Plan (2011-2031) (incorporating partial update of 2022).

9.4.8 Policy CS9 of the Joint Lancashire Minerals and Waste Development Framework Core Strategy Development Plan Document relates to Achieving Sustainable Waste Management and requires that:

9.4.9 (i) Natural resources including water, air, soil and biodiversity are protected from contamination in the vicinity of waste facilities and opportunities are taken to enhance them.

9.4.10 Development Policy DM2 of the Joint Lancashire Minerals and Waste Local Plan (September 2013) – Site Allocation and Development Management Policies – Part One aims to ensure that environmental impacts are minimised and mitigated for.

9.4.11 Wyre Council adopted their Local Plan on 26th January 2023. This incorporates a partial update from 2022 and sets out the Council's overall vision, strategic objectives, spatial strategy and strategic planning policies. Policy CDMP 1 Environmental Protection states:

1. Development will be permitted where in isolation or in conjunction with other planned or committed developments it can be demonstrated that the development:

a) Will be compatible with adjacent existing uses or uses proposed in this plan and it would not lead to significant adverse effects on health, amenity, safety and the operation of surrounding uses and for occupants or users of the development itself, with reference to noise, vibration, odour, light, dust, other pollution or nuisance, Applications will be required to be accompanied, where appropriate by relevant impact assessments and mitigation proposals;

b) In the case of previously developed, other potentially contaminated or unstable land, a land remediation scheme can be secured which will ensure that the land is remediated to a standard which provides a safe environment for occupants and users and does not displace contamination;

(i) Will not give rise to a deterioration of air quality in a defined Air Quality Management Area or result in the declaration of a new AQMA. Where appropriate an air quality impact assessment will be required to support development proposals

(ii) Where development will result in, or contribute to, a deterioration in air quality, permission will only be granted where any such harm caused is significantly and demonstrably outweighed by other planning considerations and appropriate mitigation measures are provided to minimise any such harm.

2. Proposals for the development of hazardous installations/pipelines, modifications to existing sites, or development in the vicinity of hazardous installations or pipelines, will be permitted where it has been demonstrated that the amount, type and location of hazardous substances would not pose unacceptable health and/or safety risks.

9.4.12 The Wyre Local Plan includes the Site as part of ‘SA4 of the Hillhouse Technology Enterprise Zone, Thornton’. The Plan states that the Site is expected to be fully developed within the plan period (which extends to 2031). Several key development considerations are specified, of which no. 6 relates to contamination:

6. The site is previously developed and there is the potential for ground and water contamination. A desk study will be required followed, if necessary, by more detailed site investigation.

9.4.13 Policy CS9 of the Joint Lancashire Minerals and Waste Development Framework Core Strategy DPD relates to achieving sustainable waste management and requires a core principle that:

Proposals for the Natural resources including water, air, soil and biodiversity are protected from contamination in the vicinity of wate facilities and opportunities are taken to enhance them.

Legislation

9.4.14 Land contamination can harm human health, groundwaters, surface waters, soils, ecosystems and property. As such it is controlled, either directly or indirectly, through a range of legislation, including, but not limited to:

i) Part IIA of the Environmental Protection Act 1990: establishes a system for identifying and remediating statutorily defined 'contaminated land'; and focuses on addressing contaminated land that meets the specific legal definition and cannot be dealt with via other means, including planning;
ii) Water Environment Regulations 2017: replaces previous legislation and outlines duties of regulators in relation to characterisation and classification of water bodies, environmental permitting, abstraction and impoundment of water;
iii) Environmental Permitting Regulations 2016: impose provisions to prevent ground and water contamination from operations requiring an Environmental Permit to operate and implement controls for operations relating to the treatment or handling of contaminated soils.

9.4.15 Similarly, when dealing with land that may be unstable, the planning system works alongside several other regimes including Building Regulations and the Coal Authority's responsibility for public safety risks arising from past coal mining activities.

National Best Practice and Guidance

9.4.16 The Environment Agency (EA) Land Contamination: Risk Management Guidance (LCRM)[3] provides an overarching framework for the assessment and investigation

[3] Environment Agency (2020; updated July 2023). *Land Contamination Risk Management (LCRM).* [LCRM: Stage 1 risk assessment - GOV.UK (www.gov.uk)]

of land contamination. It replaces the previous Contaminated Land Report 11: Model Procedures for the Management of Contaminated Land 2004.

9.4.17 It is designed to be used in a range of regulatory and management contexts such as voluntary remediation, planning, assessing liabilities or under the Part 2A contaminated land regime. The guidance sets out a phased approach to the assessment of land contamination and specifies requirements for reports produced as part of the process, including Preliminary Risk Assessments (PRAs) and Generic and Detailed Quantitative Risk Assessments (GQRAs and DQRAs).

9.4.18 The EA Guidance is supported by, and cross-refers to, an extensive range of additional statutory and non-statutory guidance relating to aspects such as site investigations, protection of groundwater, understanding and managing asbestos, definition of waste and the specific investigation and assessment procedures under Part IIA. Where necessary, such guidance is referred to in the following report.

Assessment Methodology

9.4.19 The ground conditions and contamination assessment has been undertaken in accordance with the framework outlined for a Tier 1 Preliminary Risk Assessment in the Land Contamination: Risk Management guidance[3]. The full assessments are presented in the supporting Phase 1 Geo-Environmental Assessment Report prepared by SGP (provided in ES Appendix 9.1).

9.4.20 In undertaking this assessment SGP has carried out the following activities:

i) A visit to view the existing Site and its setting;
ii) A review of comprehensive historical mapping and aerial photography information;
iii) A review of comprehensive environmental setting information (geology, hydrology, hydrogeology, industrial land uses, mineral excavation / extraction, landfilling / waste management activities);
iv) A review of information provided by regulatory authorities and former Site occupier;
v) A review of information relating to potential unexploded ordnance;
vi) A review of development proposals;

vii) Development of preliminary conceptual site model (CSM) with regards to ground contamination and qualitative risk assessment; and,

viii) Provision of recommendations for further investigations and mitigation appropriate to the proposed future use of the Site, where deemed necessary.

Site Inspection

9.4.21 An inspection of the Site and the immediate surrounding area was undertaken by an SGP consultant on 14th December 2023. A second visit was made on 26th January 2024 to inspect an additional area forming part of the application boundary of the Proposed Development. The Consultant was accompanied around Site by the Operations/SHE Manager of Thorntons Facilities Management Limited who provides management of facilities (site services and security etc.) for the Site and surrounding chemical works. A photographic record of salient features is provided in Appendix A of the Phase 1 Desk Based Geo-environmental Assessment report.

Preliminary Risk Assessment

9.4.22 The baseline information gathered through the Phase 1 Geo-Environmental Assessment (ES Appendix 9.1) has been used to determine a preliminary qualitative risk assessment:

i) The potential for any ground contamination to be present on or near the Site due to historical and current land uses; and,

ii) The potential for any such contamination to pose a constraint to the proposed use of the Site and / or impact the surrounding environment.

9.4.23 The information has been used to inform the risk assessment and determine any further work and/or investigations that may be required to identify any remedial requirements to ensure the Site is suitable for the Proposed Development with regards to ground contamination.

9.4.24 Information has also been obtained on general expected ground conditions at the Site and stability / physical ground conditions. Where these may constrain the planned development, information is included where relevant.

Scope of Assessment

9.4.25 An EIA screening opinion in respect to the Proposed Development was provided by Lancashire County Council dated 26 March 2024 which considered that potential effects would trigger the requirement for an EIA. The correspondence specifically mentioned the potential for pollution and contamination impacts due to expected ground disturbance during construction, the presence of a watercourse running through the Site (the Royles Brook) and the storage of waste materials as proposed.

9.4.26 Pre-application advice pertaining to the proposed development has additionally been provided by Lancashire County Council (LCC) on 22 March 2024 in relation to reference: PRE/2024/0008. The response from LCC states that a desk top study with respect to contamination should be carried out followed by a more detailed site investigation if required.

9.4.27 The available information has been used to inform the expected baseline condition at the Site with regards to ground and contamination status. The assessment considers the potential for impacts on receptors as a consequence of encountering contaminated land (soils, groundwater, ground gases and vapours) during the Construction, Operational and Decommissioning Phases of the Proposed Development. The assessment uses the source-pathway-receptor concept which forms part of a CSM.

9.4.28 This considers all potential sources of contamination, all environmentally sensitive receptors that exist now and would exist following the Proposed Development, and all potential pathways between the sources and receptors (referred to as ‘contaminant linkages’).

Source Potential

9.4.29 The Source Potential considers the likely nature, type and extent of contamination that may be present within the underlying and surface soils and groundwater, Potential off-Site sources that may impact the Site are also considered.

Receptor Identification

9.4.30 The Principal Receptors considered in this assessment are:

i) Human Health – construction workers, Site users, maintenance workers, nearby land occupiers / Users;

ii) Controlled Waters – surface waters and groundwater;

iii) Ecology – designated nature conservation sites, sensitive habitats and features; and,

iv) Building / Structures – future buildings, foundations and sub-structures and utility services.

Potential Pathways

9.4.31 Potential pathways for exposure of identified receptors to contamination include:

Table 9.1: Potential Pathways

Receptor	Potential Pathways
Human Health	Ingestion, dermal, inhalation, asphyxiation
Ecology / Ecosystems	Plant uptake from soils, groundwater, toxic impacts on fauna (ingestion/inhalation), indirect contamination of surface waters
Controlled Waters	Leaching, direct discharge, surface water run-off
Buildings / Property	Direct contact / attack on buried structures, permeation of water supplies, explosion from build-up of flammable gases.

9.4.32 The effectiveness of each contaminant pathway will be dependent on the nature and likelihood of the potential linkage and will be influenced by factors such as the distance of receptors from the source the local topography and terrain, the nature of release and dilution and dispersion, and the presence of any barriers to exposure, Where a contaminant pathway is not present then no further assessment is undertaken.

9.4.33 The assessment takes account of any intended mitigation measures to be incorporated within the design of the development.

Assessment of Significance / Assessment Criteria

9.4.34 The resulting effects are the consequences of the potential impacts, i.e. changes in environmental status of receptors arising for example from changes in pollutant concentrations. The potential effects are determined through the assessment of the potential magnitude, or severity, of impacts and the sensitivity of the receptors.

9.4.35 The determination of the potential magnitude of an impact takes into account several factors such as nature and type of potential contamination, duration, spatial extent and the likelihood of a potential contaminant linkage being present.

Receptor Sensitivity

9.4.36 The sensitivity of a receptor is determined through consideration factors such as human health exposure and the designation and legal status of controlled waters and ecological sites. Examples of receptor sensitivity are summarised below.

Table 9.2: Examples of Receptor Sensitivity

Sensitivity	Type	Criteria
High	Human Health	Construction workers: extensive earthworks e.g. extensive ground disturbance and soils movement, deep excavations Future end use of a Site: Residential, allotments, Children's play areas
	Controlled Waters	Groundwater: Principal Aquifer, Zone I Source Protection Zones, drinking water abstractions located within zone of influence of the Site. Surface Waters: River Quality – High to Good.
	Ecology	Internationally / nationally Designated Nature Conservation Sites
	Buildings / Property	High historical value or other sensitivity (Listed Buildings), World Heritage Sites, Proposed piling and significant excavations.
Medium	Human Health	Construction workers: limited earthworks, ground disturbance and movement of Site won soils, shallow excavations only Future end use: Public Open Space, landscaping
	Controlled Waters	Groundwaters: Secondary aquifers, Zone II & III SPZ, industrial water abstractions located within zone of influence of the Site
	Ecology	Nature conservation sites of local importance
	Buildings / Property	No buildings of historical value or importance. Belowground excavations and/or piling
Low	Human Health	Construction workers: minimal / no ground disturbance

		Future End use: Industrial/commercial, hardscaping (e.g. significant areas of hardstanding/buildings).
	Controlled Waters	Groundwater: Unproductive aquifers, outside of SPZ, no water abstraction nearby.
	Ecology	Soft landscaping and other areas of green space that do not have any habitat designation and are not of local importance.
	Buildings / Property	Aboveground infrastructure only.

9.4.37 Example criteria for the determination of the severity / magnitude of risk are set out below:

Table 9.3 Examples of Severity / Magnitude of Impact

Classification	Definition
Large	Qualitative risk assessment identifies one or more relevant pollutant linkages of high likelihood. Contamination levels encountered in excess of assessment criteria (for human health / environment / property). Total loss of, or alteration to, the baseline resource such that post-development characteristics or quality would be fundamentally and irreversibly changed.
Medium	Qualitative risk assessment identifies one or more relevant pollutant linkages of probable likelihood. Contamination levels encountered marginally in excess of assessment criteria (for human health / environment / property). Loss of, or alteration to, the baseline resource such that post-development characteristics or quality would be partially changed.
Small	Qualitative risk assessment identifies one or more relevant pollutant linkages of low likelihood. Contamination levels encountered below, but potentially approaching, assessment criteria (for human health / environment / property). Small changes to the baseline resource, which are detectable, but the underlying characteristics or quality of the baseline situation would be similar to pre-development conditions.
Negligible	Qualitative risk assessment identifies pollutant linkages unlikely. Contamination levels encountered well below assessment criteria (for human health / environment / property).

9.4.38 The likelihood of a contaminant linkage being present is classified as follows:

Table 9.4: Likelihood of Contaminant Linkages

Classification	Definition
High Likelihood	Contaminant linkage may be present, and risk is almost certain to occur in the long term, or there is evidence of harm to the receptor.
Likely	Contaminant linkage may be present, and it is probable that the risk will occur over the long term.
Low Likelihood	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Contaminant linkage may be present but the circumstances under which harm would occur are improbable.

9.4.39 The resulting scale of effect is determined in relation to the sensitivity of the receptor and potential magnitude of the impacts as follows:

Table 9.5 Scale of Effect of Contaminant Linkage

		Receptor Sensitivity		
		High	Medium	Low
Magnitude of Impact	**Large/Severe**	Major	Moderate / Minor	Minor
	Medium	Moderate	Minor	Negligible
	Small	Moderate/Minor	Minor	Negligible
	Negligible	Minor	Minor	Negligible

9.4.40 In general, a contaminant linkage that has either a *minor* or *negligible* effect is considered as **not significant** whereas contaminant linkage that has a perceived *moderate*, *large*, or *very large* effect is **significant**.

9.4.41 The significance of the effect for each contaminant linkage is ultimately subject to professional judgement whereby it is possible that some moderate levels of effect may be deemed insignificant depending upon the specific circumstances.

9.4.42 Examples of resulting effects are presented in Table 9.6 below:

Table 9.6 Examples of Contaminant Linkage Risk Ratings

Effect on the Receptor	Definition
Major	Severe harm to a receptor may already be occurring, or there is a high likelihood that severe harm could occur form an identified hazard. Urgent investigation and remedial works / mitigation in the short term is likely to be required. Examples include: Short-term (acute) damage to human health. Significant water pollution incident caused by uncontrolled release of contaminants e.g. major spillage or leak. Damage to a particular European, national or locally designated eco-system as a result of acute exposure. Catastrophic damage to crops, buildings or property.
Moderate	Harm is likely to arise to a receptor from an identified hazard, Investigation is required, and remedial works may be necessary in the short term and are likely to mitigate risks over the long term. Examples include: Long-term (chronic) damage to human health e.g., contaminants present above appropriate threshold values. Pollution of sensitive water resources such as through slow release of contaminants through leaching into an aquifer. A significant change in a particular ecosystem. Significant damage to crops, buildings, structures and services potentially rendering unsafe or impairing function.
Minor	There is a low be not negligible possibility that harm in the long term would arise to a receptor and if realised, harm would at worst be mild. Examples include: Long-term (chronic) damage to human health is improbable e.g. contaminants well below appropriate threshold values. Appreciable pollution of a low or non-sensitive water resource, e.g. non-classified groundwater is unlikely. Easily repairable damage to sensitive buildings / structures / services or the environment.
Negligible	There is a negligible possibility that harm could arise to a specific receptor.

Limitations

9.4.43 Baseline ground condition data has been obtained through a review of existing information which included a Phase 1 Geo-Environmental Assessment. As yet, there are no Site Investigation data to confirm the expected ground and contamination conditions on the Site. Whilst the investigation seems largely adequate to assess and characterise the Site qualitatively, conditions may exist at the Site that have not been identified to date and may be encountered during the Site investigation as proposed.

9.5 Baseline

Current Condition and Historical Land Use

Site Description

9.5.1 The Site is a recently demolished PVC powder production facility. There are no buildings or infrastructure on Site aboveground other than a 1970s single storey building in the east and a VCM off-loading control room (a small metal clad building) which is still present in the southwest. The 1970s building used to house officing and laboratories and is to be demolished as part of the Proposed Development.

9.5.2 Outside of the concrete building slabs, crushed hardcore has been spread across the Site surface, the origin of which, is understood to have been generated from crushing of former buildings and other brick built or concrete structures.

9.5.3 Vegetation was present along the northeast, southwest, and southeast boundaries It was also present in the south of the southwest section of the Site. Thick brambles were present along both embankments of Royles Brook.

9.5.4 The Site area to the southwest of Royles Brook comprised of the former VCM off-loading area and open land. It contained a small control building (no longer in use), concrete pads, and relict drainage in the north. Along the southern boundary, an unused foundation slab was noted during the Site inspection which was set 1m below ground level (bgl), with four small aboveground concrete towers rising up 2m from the slab.

9.5.5 A circular concrete pad was present in the southeast corner, raised approximately 1m above ground level. The remaining area was overgrown with brambles.

9.5.6 The Royles Brook which flows from northwest to southeast through the centre of the two proposed development areas of the Site is at approximately 2m below the Site level.

9.5.7 The Site is accessed from South Road and the Proposed Development may require minor amendments to the road to ensure access. No other rights of way cross the Site.

Site Surroundings

9.5.8 The Site lies flat at an elevation of between 5m and 10m Above Ordnance Datum (AOD) and is approximately 3m below the level of an embankment that runs along the Site to the immediate northeast (which is also a Public Right of Way). The River Wyre its associated estuary and saltmarshes / mudflats are located directly beyond the embankment and associated bridleway and at around 5m AOD.

9.5.9 The Site itself is located within a large industrial area specialising in the manufacture of various chemicals and polymers. Some industrial areas are no longer operational. Karpa Engineering Solutions (industrial machinery manufacturer) is located directly east, a PVC window frame manufacturer is located directly to the southeast, and a crane hire business is located to the south of the southwest section of the Site.

9.5.10 An oil store with fence is present across the road from the Site which backs onto vegetated land. A strip of open land overlying a live water main and electric service (approximately 1m bgl) backing onto Royles Bank lies to the southwest of the Site. An 11kv switch house and fence line back onto the Victrex operating plant located off-Site to the northwest.

9.5.11 The former Vinnolit 11kV switch house lies 50m to the south of the southwest section of the Site.

9.5.12 Victrex Manufacturing Limited operates the Site located immediately to the northwest. This is recorded to manufacture organic materials and plastic materials (Polyaryletherketone polymers) and operated under an environmental permit which was issued in 2006 (although it is possible that the Site was active under a former permit prior to this).

9.5.13 The Site is bounded to the northeast by a 7m embankment covered with vegetation of shrubbery and brambles. To the southeast the Site is bounded by two existing businesses and the access road. The Site is divided in two by Royles Brook. The southwest section of the Site is bounded to the west by a road onto open land and by Daly Cranes to the south.

Site Services

9.5.14 A network of surface water drains underly the Site with one live water main running along the southwest boundary and through the southeast of the Site, linking to a still live fire hydrant in the centre of the Site. This water main then carries on across the access track over Royles Brook and crosses the southwest section of the Site from the east to the southwest corner to another live fire hydrant and continues westwards. Live electric cables also run along the southwest boundary, cutting into the Site in the southeast, providing power to the existing businesses off-Site. A small substation and 11kv switch house are located 15m and 50m to the south of the southwest section of the Site. A live belowground ethylbenzene pipe of 100mm in diameter padded with nitrogen gas runs from the southeast along the road before cutting northeast past the office building.

9.5.15 A 27-bar high pressure gas main is located to the east of the Site with the pipeline running beneath the bridleway to the northeast. There are two live watermains which serve the Site. Redundant lampposts remain on Site (which are not live).

Discharges from Site

9.5.16 The surface water drainage on Site is directed through a below ground surface water drainage system and infiltration through any soft ground. Surface water is directed towards the Royles Brook at two locations located upstream of a penstock where water flow can be controlled. The outfalls to the Royles Brook are located at the southern and southeastern Site boundaries.

9.5.17 A septic tank which collects foul drainage is located on Site adjacent to the 1970s office building which is understood to have been installed in 2015. This essentially operates as a cess pit which gets routinely emptied by pump out to tanker as is not connected to any discharge outfall. When the Site was previously in operation, the foul discharge was treated at an on-Site effluent treatment plant and discharged under consent to the River Wyre.

9.5.18 There are several former licensed water discharges to Controlled Waters registered on the Site, all of which have now been revoked. These were for the purposes of discharging treated process effluent, cooling water and 'emergency discharges' to the Wyre Estuary. The effluent was treated on Site within the treatment plant and pits located in the northern corner of the Site. The effluent plant has been decommissioned and demolished to ground slab and the below ground pits have since been infilled. The belowground pipework connecting the former plant to the discharge outfall is still in-situ.

9.5.19 The Site is also recorded as having List 1 Dangerous Substances discharge (relating to mercury) with the receiving watercourse as Wyre Estuary and registered to Ineos Vinyls (UK) Limited. It is, however, understood that mercury has not been used to process the PVC (for example being used as a catalyst within the production of brine). The presence of elemental mercury is unlikely.

Geology and Ground Conditions

Made Ground

9.5.20 BGS mapping reports the presence of made ground (artificial deposit) across all but the southern quarter of the Site. However, considering the previous industrial use and presence of hardstanding Site-wide, made ground is anticipated across the whole Site. The thickness of made ground is not currently known.

Superficial Deposits

9.5.21 BGS mapping shows the entire Site to be underlain by Tidal Flat Deposits – clay and silt. The thickness of superficial deposits is not known. Glacial Till comprising boulder clay is anticipated to underlie the Tidal Flat Deposits.

Bedrock

9.5.22 BGS mapping shows the northwestern two-thirds of the Site to be underlain by the Preesall Halite Member comprising Mudstone and Halite stone with the southeastern area comprising bedrock of Kirkham Mudstone Member.

Geological Features & Sources of Radon Gas

9.5.23 No faults are mapped crossing the Site. The closest fault is located at 466m to the southeast. There is an axial plane (geo-syncline) located at 95m to the northwest.

9.5.24 The Site lies within an area where between <1% of homes are estimated to be at or above the Radon Action Level and therefore the installation of radon protection measures will not be necessary within new buildings.

BGS Records

9.5.25 The closest available BGS borehole records available for review are at 250m to the southwest. Borehole log record SD34SW193 reports made ground to 0.2m underlain by silty clay and clayey silt of the Tidal Flat Deposits to 4.1m and boulder clay (Glacial Till) to base at 14.5m bgl. A borehole drilled adjacent to this (SD34SW194) extended to 25m bgl. This reports 4.0m of soft mottled brown-grey clay and clayey silt with organic matter followed by soft becoming firm red brown sandy boulder clay with gravel to 14.4m which is followed by hard red and green clay containing gypsum crystals below 17.3m bgl. Groundwater was encountered at 2.3m bgl within the underlying Tidal Flat Deposits.

Natural Ground Stability

9.5.26 The Weston half of the Site is in an area where ground dissolution of soluble rocks is high. This coincides where the bedrock of the Preesall Halite Member is recorded. This coincides with the western half of the proposed stockpile shed and a clean water storage tank. Areas of hardstanding external to the building will also be developed within this area. The risk of dissolution of soluble rocks is negligible where the Kirkham Mudstone is mapped which applies across the eastern half of the Site. The recorded risk of shrink swell clays and landslides is low. Risks from compressible ground and running sands are very low across most of the Site but recorded as ‘moderate’ both within the southern third and northern tip.

Hydrology and Flooding

9.5.27 The Royles Brook separates the Site into two areas with an access track joining the two sections. The Royles Brook also crossed the southeastern part of the Site which forms part of the existing South Road. The brook flows under this road within a small section of culvert south-eastwards where it confluences with the Hillylaid Pool which flows east to discharge into the River Wyre. The Wyre Estuary is located at 50m beyond the full length of the northeastern Site boundary.

9.5.28 The Site benefits from flood defences constructed along the bank of the river Wyre and as such, is at low risk from river and coastal flooding. The Site is located within

Flood Zone 3 and is mainly at risk of surface water flooding of between 0.3 and 1.0m on a 1:1,000-year flood return period. There is a small area within the north/central area which is classed as at 1 in 30 yr flood return period of being affected by flooding of between 0.3 and 1.0m depth.

Hydrogeology and Groundwater Conditions

9.5.29 The aquifer designations of the underlying geological units are:

i) Superficial Deposits: Tidal Flat Deposits- Clay and Silt: Unproductive aquifer of mixed intergranular flow and very low to low permeability.

ii) Bedrock: Preesall Halite Member – Unproductive aquifer;
Kirkham Mudstone Member – Secondary B aquifer

9.5.30 The permeability of the bedrock on Site is recorded as predominantly via fracture flow and low. Groundwater vulnerability is recorded as low. The Site is not located in any Source Protection Zones.

Excavation / Mining

9.5.31 Surface ground workings are recorded on Site in the form of a former pit which is identified on historical mapping of 1968. It is unclear whether this has been infilled (and was not observed during the walkover). No further details are available. The Site is not located within an area of historical coal mining.

9.5.32 A mound has been identified on historical mapping in the southwest section of the Site, along the edge of Royles Brook in 1967. However, it is removed from mapping in the 1970s and no further information is available. This is more likely to be silts, sands and gravels related to dredging of the watercourse and was not identified during the Site inspection.

9.5.33 An elongated mound located within the northwestern Site area which extends of Site further to the northwest is shown on historical OS mapping by 1960 until 1980. It is considered this most likely an embankment for the railway and is located on the area of a bund for the Site. Similarly, there is an excavation shown in the northern central area of the Site present during the same period but rather than an excavation, this is considered likely to be a collection of embankment created in close proximity to each other to accommodate for each railway spurs which cross the Site within this area.

9.5.34 These historic mounds are not classed as landfills within the Groundsure report which is included within the geo-environmental assessment report.

Landfill / Waste Disposal

9.5.35 The Groundsure report shows that there are no landfills on Site. Two historical landfills are located within 500m of the Site. This includes:

i) Historical waste Site: 250m to northwest (beyond Royles Brook); and,
ii) Former household waste landfill, licensed December 1960 to December 1970 located 431m to southeast (now forming part of the Wyre Country Park). Recorded to Stanah House Farm. No further details have been made available.

9.5.36 An application for a thermal treatment facility has been lodged in March 2023 for a Site located 240m northwest, the outcome of which is currently unknown.

Pollution Incidents

9.5.37 Two incidents have occurred within 250m of the Site as follows:

iii) 46m N: Significant (Category 2) impact to water reported 01/01/2005. Pollution description was ‘other pollutant’. Incident reference: 285281. No further details are available.
iv) 59m NW: Significant impact to land and minor (Category 3) impact to water reported on 28/8/2018 which involved release of acids and alkalis. Incident reference: 1647147. No further details are available.

9.5.38 It is possible that the two above incidents may be associated with release of pollution from the effluent discharge chambers which discharge to the River Wyre. It is understood that the Site used to discharge treated effluent from this location in addition to several other chemical plants within the immediate vicinity. The pollution source in this instance is unknown although it is not anticipated that this pollution incident will have significantly impacted the Site.

Ecology / Nature Conservation

9.5.39 At around 15m the north/northeast of the Site lies the River Wyre and Wyre Estuary which is designated as a Site pf Special Scientific Interest (SSSI), RAMSAR[4], SPA[5] and Marine Conservation Zone.

9.5.40 The Site is also within part of land designated as Priority Habitat Network (Zone 1 and Zone 2), a SSSI impact risk zone and Marine Conservation Zone.

Unexploded Ordnance (UXO)

9.5.41 Publicly available UXO risk mapping identifies the Site as located within an area considered as Low Risk.

Contamination Sources

On-Site Sources of Contamination

Previous Industrial Operations

9.5.42 Leaks and spillages of substances to ground and shallow groundwater may have occurred during the 40yrs operation of the Site as a plastics powder manufacturer. Such contaminants could include:

i) dissolved and solid PVC[6], PCM[7] and latex;
ii) Volatile organic compounds (VOCs) in both liquid and vapour form;
iii) Chlorinated solvents (liquid and vapour form);
iv) Acids and alkalis;
v) Ammonia and ammonium;
vi) Sulphates;
vii) Sodium, fluoride, chloride;
viii) Chlorine (gas);
ix) Petroleum hydrocarbons and oils,

[4] *For the protection of peatland*
[5] *Special Protection Area (for the protection of birds and wildfowl*
[6] *Poly vinyl chloride*
[7] *Polychloride monomer*

x) Heavy metals including copper, cadmium, mercury[8];

xi) Change in parameters such as pH, chemical oxygen demand (COD), electrical conductivity, redox potential and temperature.

9.5.43 Although all tanks, buildings, effluent treatment plant and other infrastructure associated with the previous industrial operations on Site have been removed to slab level, there are potential point sources of contamination to be located within the ground around the Site (which could include potential relict drains, sumps and other belowground features). This is specifically within the former processing, raw materials and processed materials storage areas plus surrounding and underlying the former effluent treatment plant with pit and VCM off-loading area.

9.5.44 The condition of the drains underlying the Site is unknown and if pipes are damaged, this could give rise to release of contaminants to the surrounding ground and shallow groundwater.

9.5.45 According to environmental data reviewed as part of the Phase 1 Geo-Environmental Assessment, there have been no pollution incidents reported on or to have affected the Site.

Made Ground

9.5.46 Artificial and made ground are mapped by the BGS in the northeast / north of the Site but it is anticipated to be to present at relatively shallow depth across Site. The earth bund along the western Site boundary and the southern boundary of the southwest section of the Site is anticipated to contain made ground and/or reworked natural material. Site surface water drainage is in-situ alongside a small number of live services. Below ground infrastructure is still present underlying the ground slabs of former buildings. The source and form of made ground will determine the presence and nature of contamination presented. Within an urban environment, made ground can typically contain varying concentrations of metals and metalloids, asbestos, polyaromatic hydrocarbons (PAHs), petroleum hydrocarbons and, if significantly thick deposits are present, potentially ground gases (principally of carbon dioxide and methane).

[8] *Generation of brine using mercury as a catalyst was not undertaken within industrial operations on the Site.*

9.5.47 A mound was identified on Site along the southwest bank of Royles Brook in 1967 but is removed from mapping by the 1970s. It is assumed to be related to dredging of the watercourse but cannot be confirmed.

Former Railway Line

9.5.48 Former railway sidings and a railway line were previously located upon an embankment across the northern, northwestern and southeastern boundaries before crossing Royles Brook into the southwest of the Site. – contaminants typical of such facilities include heavy metals, metalloids, PAHs, asbestos, phenols, heavy end hydrocarbons. It is possible that when the railway was dismantled, the embankment may have remained to be used as a Site flood defence or may have been spread across the Site.

9.5.49 There is consideration that a small unspecified pit is located within the north of the Site as shown on 1968 OS mapping. However, upon closer inspection, it is considered that this appears to show a pit based on the presence of surrounding railway embankments. Nevertheless, this may have been ‘infilled’ with surrounding material when the embankments were dismantled although this assumption cannot currently be confirmed.

Natural Sources of Ground Gas

9.5.50 The Tidal Flat Deposits underlying the Site could contain peat and organic content which could generate natural ground gases. It is noted, however, that exploratory hole logs from the surrounding area have not reported the presence of peat. Regardless of the tidal nature of groundwater coupled with a high-water table, they are only likely to generate relatively low gas volumes. The mobilisation of ground gas is expected to be impeded by the groundwater saturation and the presence of a predominant low permeability matrix of silt and clay. The generation potential would increase if the Tidal Flat Deposits and organic materials contained within were to be dewatered as part of development proposals. Significant thicknesses of natural peat deposits are considered unlikely in association with the Tidal Flat Deposits on Site. Of the two available logs at 250m from the Site, one contained organic matter within the clay and silt to a depth of 4.0m bgl and the other did not hence it is possible peat may be located within isolated locations.

Off-Site Sources of Contamination

Nearby Heavy Industry

9.5.51 Extensive industrial works have occurred to the northwest, west and southwest and east of the Site with the development of an ammonia soda works and gas works around 1910 and the ICI Chemicals plant in the 1950s which persisted until 1999. This increased industrial land usage has led to the development of infrastructure including road links and historical railway sidings.

9.5.52 Previous pollution incidents recorded by the EA to nearby industry are not considered to have directly affected the Site.

Potential Receptors

9.5.53 No foundation or service designs have been provided but is assumed the processing building, stockyard shed and other large infrastructure will have foundations which will be piled or require deep excavations. The three proposed new office/welfare buildings will all be in a containerised/portacabin format, sites on plinths and hence raised above the ground surface.

9.5.54 The operational areas of the Site will likely be surfaced with compacted aggregate and / or hardstanding. One strip of soft landscaping will be provided as a verge along a proposed pedestrian route on Site. All the operational areas will be covered with hardstanding. Small areas of landscaping will be developed outside of the operational areas.

9.5.55 The proposed industrial use of the Site is considered as low sensitivity with respect to human health.

9.5.56 The principal vulnerable receptors with respect to potential exposure to any contamination that may be present for the proposed use will be:

i) Construction workers who may be exposed to contaminants during preparatory and construction / and maintenance worker who may be involved in future refurbishment works;
ii) Future Site users and Site visitors;
iii) Adjacent Site neighbours;
iv) Proposed buildings / structures;

v) Controlled waters: Surface waters including Royles Brook, Hillylaid Pool and Wyre Estuary/River Wyre); groundwater within underlying aquifers (Tidal Flat Deposits as an unproductive and impermeable aquifer with the underlying Preesall Halite Member and Kirkham Mudstone Member as unproductive and Secondary B aquifers, respectively; and,

vi) Vegetation and Ecological receptors including the nearby designated SSSI/Ramsar, SPA and marine conservation zone of the Wyre Estuary and associated saltmarshes.

Future Baseline

9.5.57 The Site will include further coverage with buildings and areas of hardstanding and hardcore. No areas of soft landscaping are proposed within the operational area. Small areas of soft landscaping will be developed outsdie of operational areas on Site and soft landscaping present around the Site boundaries and along the banks of the Royles Brook shall remain.

9.5.58 The operations on Site will be subject to the obtaining an industrial (Part A) Environmental Permit from the Environment Agency. This will set out the expectations of the EA including required environmental management and monitoring of operations, storage of fuels, chemicals, other materials and wastes.

9.6 Assessment of Effects

Embedded Mitigation

9.6.1 The assessment takes account of the physical incorporated or embedded in-design mitigation measures within the Proposed Development.

9.6.2 These include the provision of:

- Intrusive investigation and risk assessment with regards to contamination and geotechnical requirements;
- Production of a Remediation Strategy thereafter, as required, to include measures required to suitably prepare the Site for re-development;
- Production and implementation of a Construction Environmental Management Plan (CEMP) to support the construction phase which is to include measures for asbestos awareness and management, and emergency environmental

protocol to deal with any pollution incidents plus routine monitoring of surface watercourses as necessary;

- Surfaced hardstanding / built development to cover across all operational areas of the Site. Small areas of soft landscaping are proposed outside of operational areas);
- Provision of a piling risk assessment where piles are proposed;
- Provision of a water supply pipeline risk assessment where belowground water supply pipes are proposed;
- Asbestos survey and removal by a suitably licensed contractor prior to demolition of any buildings and ground disturbance;
- Provision of a Materials Management Plan (such as one provided via means of DoWCoP[9]);
- Operation under the requirements of an appropriate environmental permit authorised by the EA;
- Bunded aboveground fuel (diesel) and chemical (adblue) tanks with 110% volume capacity and only above ground associated pipework; and,
- Surface water drainage system with fuel interceptor.
- Recirculatory foul drainage system with no off-Site discharge.

9.6.3 A finalised development design would be informed by a geotechnical and contamination investigation. The investigation would be Site-wide and would involve investigation with regards to contamination within soils and groundwater plus the presence of ground gases and VOCs which would inform the overall design, construction and any remedial requirements. The findings of the additional investigation and assessments would allow for an update of the existing risk assessment, updating of the CSM and development of remedial recommendations.

Construction Phase

9.6.4 The construction phase, including Site enabling works / groundworks, plant installation and plant testing is anticipated to take around 15 months in total.

[9] *(CL:AIRE, March 2011) Definition of Waste: Development Industry Code of Practice. Version 2*

9.6.5 Works during the construction phase would include the construction of a temporary compound area either on Site or immediately adjacent. The compound area would house modular office and welfare facilities on existing made ground surface and / or existing slabs.

9.6.6 The storage of fuels or chemicals required during the construction phase will be limited to diesel generators to provide power to the compound area and above ground diesel and ad- blue tanks for re-fuelling Site plant. Such fuel storage would be housed appropriately and bunded, refuelling would be limited to designated re-fuelling areas and a suitably stocked spill-kit will be retained within the compound areas as part of a standard construction compound requirement.

9.6.7 Prior to construction works commencing, preparatory works will be undertaken to remove, where necessary, the existing surface hardstanding and below ground structures including any relict foundations and drainage down to a nominal depth of 1.2mbgl. A Site investigation undertaken prior to this will identify whether the surface hardcore and other hardstanding is contaminated as it is understood this has been derived from demolition of previous buildings.

9.6.8 Turnover of surface made ground will be required to facilitate the removal of relict foundations and subsurface structures which may otherwise impede development. During this operation, significantly contaminated soils (i.e. where free product or chemical is present) will be removed and / or subject to remedial treatment, the scope of which would be informed following completion of the recommended Site Investigation followed by production of a Remediation Strategy.

9.6.9 During the construction stage, groundwater management practices would be adopted where groundwater is encountered. Dewatering practices may include a series of cut-off trenches and pumping employing best engineering practices.

9.6.10 A CEMP will detail proposals to prevent the generation and runoff of silty or otherwise contaminated water to the Royles Brook, River Wyre or the other nearby watercourses during the construction phase. This will include monitoring of the adjacent surface waters for a series of related contaminants at a specified location downstream of the Site.

Sensitivity of Identified Receptors

9.6.11 Potential receptors to adverse impacts from ground contamination during the construction phase include construction workers and Site visitors, nearby users of the adjacent industrial and commercial premises, groundwater underlying the Site, surface water flowing within the Royles Brook, Hillylaid Pool, and the River Wyre plus the nearby habitats of the Wyre Estuary.

9.6.12 The sensitivity of the receptors during the Construction Phase, with reference to Table 9.7, are summarised below:

Table 9.7 Sensitivity of Identified Receptors During Construction Phase

Receptor	Sensitivity	Comment
Construction Workers	Medium	Moderate ground disturbance anticipated including piling. Extensive Made Ground across the Site. Contamination within Ground and Perched groundwater above corresponding threshold limits may be anticipated within select areas.
Existing Site Users of Adjacent Land	Low – adjacent industrial premises High – members of public using Public Right of Way (located along embankment of Wyre Estuary)	Dust and debris to adjacent users of Public Right of Way along embankment between Site and Wyre Estuary and to adjacent Site users of nearby industrial premises.
Groundwater (superficial)	Low	Underlying Tidal Flat Deposits / Glacial Till unproductive strata, not located within a Source Protection Zone. Groundwater anticipated to be brackish and tidal.
Groundwater (bedrock)	Low to Medium	The Kirkham Mudstone Member is a Secondary B aquifer. The Preesall Halite Member is an unproductive aquifer
Surface waters (Royles Brook / Hillylaid Pool / River Wyre)	Low	River Wyre has a WFD classification of poor.
Property/building	Low	The office building remaining on Site is to be demolished as part of the proposed development and relict foundations of previous industrial operations are to be removed where required.

Wyre Estuary SSSI / SPA	High	River Wyre is classed as SSSI, an SPA, conserved wetland area, marine conservation site and Ramsar site.

Potential Impacts on Identified Receptors During Construction Phase

9.6.13 The potential impacts on these receptors during the construction phase is considered as low and takes account of incorporated mitigation measures within the design of the Proposed Development and will also take account of recommendations for remediation following a Site Investigation as proposed.

Potential Impacts on Human Health During Construction (includes groundworks)

9.6.14 Construction workers could be exposed to contamination associated with the former industrial activities (as detailed within 9.6.42 previously) during disturbance of ground as part of Site preparation and construction activities. Potential exposure routes are via inhalation, ingestion and / or dermal contact with contaminated soils, soil dusts, water and / or gases / vapours.

9.6.15 A Site investigation and assessment of contamination as suspected from the qualitative risk assessment will be required prior to the commencement of any Site preparatory or construction works. This will help to establish whether contamination exists. Where appropriate, a Remediation Strategy detailing how the contamination will be suitably and sufficiently mitigated will be prepared thereafter.

9.6.16 Preparatory works will be undertaken prior to construction works to prepare the Site and would be completed in accordance with the Remediation Strategy. It is expected that this will include the removal of surface hardstanding, turnover / proof-dig of made ground soils to remove sub-surface structures within areas of the proposed development (to allow for piling etc,) and the removal of any significantly impacted soils and perched groundwater identified during this process. The soil bunds surrounding the Site will not be disturbed during construction and will not require investigating to facilitate the proposed Site development. Verification works and post remediation monitoring to demonstrate the efficiency of the remedial works will be undertaken as necessary. Asbestos management may be required where asbestos is identified within soils and back fill materials during the Site investigation. As part of confined space protection measures, any staff entering confined spaces will have been provided suitable training and will wear gas alarms and VOC monitoring will be employed where necessary.

9.6.17 With embedded mitigation, the likelihood of exposure of construction workers is considered as ***low*** with the resulting magnitude as ***small*** and the overall scale of the contaminant risk effect is ***minor.***

9.6.18 Preparatory and construction works, particularly during ground disturbance activities, is likely to result in the generation of dust and debris in the absence of mitigation measures. Preparatory and construction works, will, however be completed in accordance with a CEMP which will include dust suppression measures to be employed during potential dust generating activities including disturbance and excavation of Site-soils and processing of Site-generated hardstanding as part of preparatory works. Potential residual contaminants within the made ground and demolition fill material may be present although significant quantities are not considered likely.

9.6.19 The likelihood of such residual contamination being present and exposure of neighbouring users occurring when the incorporated mitigation measures are implemented is considered as ***low*** with the resulting severity as ***small*** with the overall scale of the contaminant risk effect is ***minor***.

9.6.20 It is currently uncertain whether the construction compound will be located on or off-Site as this will be managed by the Contractor. The compound will either be situated on an existing slab or if located within areas of exposed made ground, a compacted aggregate cover layer would be placed to provide a temporary surface. A slab and / or compacted aggregate layer would break the migration pathway between any made ground and Site workers and the investigation of the nature of the existing compacted hard core plus soils will have been undertaken. It is expected that the compound facilities (office, welfare etc.) would be constructed from modular units which reside on a frame or legs rising them above ground level. The resultant void-space between the floor and ground level acts as a venting void which would dilute and disperse any carbon dioxide, methane and / or VOCs if present.

9.6.21 The construction compound is temporary and would be removed following the commencement of operational works on the Site.

9.6.22 A CEMP will be implemented to ensure generation of dusts and debris etc. is kept to a minimum. The likelihood of exposure of any residual contaminants to human health during the operation of the construction compound is ***unlikely*** with resulting ***negligible*** severity magnitude and ***negligible*** scale of effect. The overall effect is therefore ***not significant.***

Potential Impact on Controlled Waters

9.6.23 Residual and most likely, localised contamination is expected within shallow soils and perched groundwater. The impacted groundwater may be associated with the leaching of made ground soils and historical leaks and spills which may have occurred on Site. The groundwater within the upper and granular layers of the Tidal Flat Deposits may also be impacted although as the superficial deposits are mapped as largely being cohesive, downward migration of contaminants is expected to be very limited.

9.6.24 Following intrusive Site investigation and under the requirement of expected remedial works, significantly impacted soils and perched groundwater would be removed in areas where the development is proposed. There is potential that increased leaching rates of contaminants may occur during ground disturbance works, in the short term, although, significantly impacted soils will have been removed under the Remediation Strategy at this stage. With the implementation of embedded mitigation, the probability of a contaminant linkage being present to controlled waters is ***low***. The resulting severity/magnitude is ***small*** within the southeastern third of the Site (overlying the Kirkham Mudstone Member which is a Secondary B aquifer) and **negligible** severity within the northwestern two thirds of the Site which overlies the Preesall Halite Member (an unproductive aquifer). This equates to a corresponding ***minor*** scale of effect.

9.6.25 The foundation solution for the processing building and stockyard shed is yet to be confirmed and will be subject to additional investigation works. It is, however, expected that a piled foundation solution down to competent bearing strata, anticipated to be Glacial Till underlying the Tidal Flat Deposits or bedrock of either the Preesall Halite Member or the Kirkham Mudstone will be adopted. Piles could serve as a migration pathway for mobile contaminants, which, depending on the depth of piles, could serve a migration route to the Secondary B aquifer within the bedrock. A Piling Risk Assessment (PRA) would be required to inform the suitability of the pile design, after remedial works to remove unacceptable contamination have been validated. Piling may require the adoption of mitigation such as bentonite cut off and/or monitoring to prevent the introduction of contaminants into the bedrock aquifer. After further assessments, remedial works and piling mitigation as required, the potential likelihood for this contaminant linkage to be realised is considered as ***low*** with resulting ***small*** magnitude/severity and ***minor*** adverse effects.

9.6.26 The Royles Brook runs through the central corridor between the two development areas. The saltmarshes of the Wyre Estuary are located at approximately 15m to the North. Groundwater within the Tidal Flat Deposits (and potentially the overlying Made Ground) is expected to be in hydraulic continuity with the River Wyre and hence will likely be tidal and brackish nature. The Hillylaid Pool and Royles Brook are not tidal in nature but are connected to the Stanah Pumping Station which operates during periods of high rainfall to prevent flooding of the Site and remainder of the Hillhouse Industrial Estate. Works are proposed within 8m of the banks of the Royles Brook. This will comprise construction of a footpath and infrastructure for a conveyor As such, there will be the need to obtain a Flood Risk Activity Permit (FRAP) from the Environment Agency in advance of any proposed works within this area of the Site.

9.6.27 Despite the River Wyre having an overall WFD classification of poor, the ecological classification as a SSSI, SPA, marine conservation area, conserved wetland area and Ramsar Site increases the sensitivity of this receptor to high.

9.6.28 Further assessment with regards to the risk from contamination on the Site to controlled waters is proposed, which will inform remedial requirements to be implemented as part of preparatory works and will include the removal or treatment of significant impacted soils and perched groundwater and relict infrastructure which may contain limited volumes of point source contamination. The presence of natural cohesive soils, which are mapped on Site, will also retard both the lateral and vertical migration of any mobile contamination towards the Royles Brook and River Wyre. A CEMP will include suitable measures to prevent the runoff of silty and otherwise contaminated water to surface waters. Mitigation measures to prevent the generation of dust and debris alongside surface water monitoring and sampling will also be employed during construction as part of the CEMP. It is recognised that impacted perched groundwater is likely to exist beyond the boundaries of the Site associated with off-Site historical industrial works and potentially from current controlled discharges from industrial facilities. With consideration of the embedded mitigation including a CEMP and expected removal of significantly impacted soils and perched groundwater during the remedial phase, exposure of contaminants to the surface watercourses from the Site during the construction phase impacts is considered as having a ***low*** likelihood. This, alongside a small severity for the Royles Brook. Hillylaid Pool results in ***minor*** adverse impacts.

9.6.29 The sensitivity of the River Wyre ecosystem is ***high***. However, the presence of an existing bund affords some protection from the impact of dust and debris. There are no outfalls to the River Wyre at present as all surface water is discharged to the Royles Brook. The likelihood of the contaminant linkages is ***negligible***. This, together with the embedded mitigation presents the magnitude of impact as ***negligible*** and results in a ***minor*** adverse impact.

9.6.30 During construction works there is potential for the generation and off-Site loss of silty run-off following exposure of Site soils. Mitigation measures incorporated within the CEMP to manage surface run-off during construction through use of best available techniques will be adopted. The Royles Brook flows between the two development areas with overgrown banks either side. The likelihood of exposure to the watercourse from silts is considered ***low*** due to the mitigation measures to be employed within the CEMP with resulting ***small*** severity of impact and thus ***minor*** adverse effects.

9.6.31 The overall significance in relation to the construction phase and risks to controlled waters is considered as ***not significant*** when required remedial measures to address contamination during the preparatory stage and design measures within the CEMP are considered.

Potential Impacts on Property

9.6.32 Although most volatile contaminants used within the previous industrial operations are suspected to have largely degraded, there is the potential for residual hydrocarbons and VOCs within the shallow soils. These may have the potential to permeate belowground plastic water supply pipes. As part of the design mitigation measures, a water pipeline risk assessment utilising Site Investigation data or, where appropriate, post-remediation data, would be undertaken to establish whether barrier pipe is required to mitigate against the potential for impact on proposed water supply pipes. Exposure is therefore considered to be ***unlikely*** on this basis with a resulting ***negligible*** severity and ***negligible*** adverse effect.

9.6.33 It is expected that aggressive concrete conditions will be encountered within soils and perched groundwater. This will be investigated as part of a geotechnical investigation for the Site to derive a suitable Design Sulphate (DS) Class and Aggressive Chemical Environment for Concrete (ACEC) classification of AC-2 has been recommended based on the Site Investigation data to date. Owing to the potential presence of hydrocarbons and volatile compounds within the ground, the findings should be provided to a concrete specialist to ensure that appropriate concrete design against the retardation of hydrocarbons is implemented as part of the in-built design mitigation measures. Exposure of concrete structures is therefore considered to be ***unlikely*** with a resulting ***small to medium*** severity and ***minor*** adverse effect.

Potential Impacts on Ecology & Ecosystems

9.6.34 Potential impacts on the River Wyre, and hence associated ecosystems, have been considered above under controlled waters.

Overall Significance of Construction Phase

9.6.35 The overall significance in relation to the construction phase for all potential receptors, when design mitigation measures and further required investigation and remediation of impacted soils / groundwater is accounted for, is considered ***not significant***.

Operational Phase

9.6.36 Potential receptors to adverse impacts from the identified ground conditions during the operational phase include future Site users and maintenance engineers, future built development, infrastructure and services, groundwater and the designated Secondary B aquifer of the Kirkham Mudstone, the nearby surface watercourses and associated ecology of the Royles Brook and River Wyre/Wyre Estuary. The Preesall Halite aquifer is an unproductive aquifer The assessment includes in-built design measures and will take account of preparatory remedial works which will be detailed within a Remediation Strategy and will include the removal of significantly impacted material, if identified, following further assessment.

Sensitivity of Identified Receptors

9.6.37 The sensitivity of receptors identified for the operational phase, are summarised within Table 9.8 below:

Table 9.8 Sensitivity of Identified Receptors During Operational Phase

Receptor	Sensitivity	Comment
Future Site Users	Low	Disturbance of ground during operational phase is expected to be minimal. Ground will be covered with hardstanding and buildings across all operational areas. Bunds and other areas of soft landscaping are expected to be used only infrequently.
Site Users of Adjacent Land	Low to High	Low – adjacent industrial premises High – members of public using Public Right of Way (located along embankment of Wyre Estuary)
Groundwater (superficial)	Low	Hardstanding and buildings to cover the majority of the Site. Site drainage to be treated and recirculated within industrial operations. Contaminated water to be tankered off-Site. Underlying Tidal Flat Deposits / Glacial Till unproductive strata, not located within a Source Protection Zone. Groundwater anticipated to be brackish and tidal.
Groundwater (bedrock)	Medium to Low	Medium - The Kirkham Mudstone Member is a Secondary B aquifer. Low - The Preesall Halite Member is an unproductive aquifer
Surface waters (Royles Brook / Hillylaid Pool / River Wyre)	Medium	River Wyre and Royles Brook/Hillylaid Pool has a WFD classification of poor.
Property/building	Low to medium	Industrial in nature Medium - large processing building, stockyard shed and metal shed. Low – officing, laboratory and welfare facilities constructed as a modular build on struts raised above the ground.
Wyre Estuary SSSI / SPA	High	River Wyre is classed as SSSI, an SPA, conserved wetland area, marine conservation site and Ramsar site.

9.6.38 The potential impacts and effects on these receptors during the operational phase, taking account of the required preparatory remedial works and in-build design mitigation measures are discussed below:

Potential Impacts on Human Health During Operation (includes maintenance workers plus other future Site users)

9.6.39 The potential for exposure pathways would be ***unlikely*** due to the presence of hardstanding or buildings within all operational areas and ***low*** within the strip of verge proposed along the footpath. The hardstanding and buildings will naturally provide a physical barrier to the underlying contaminants. The Site investigation followed by Remediation Strategy would inform the required developer-stage remedial measures as required and materials management will be employed to ensure any soils imported and/or reused on Site are chemically suitable.

9.6.40 Hydrocarbon and VOC impacted soils and perched groundwater may be present and it is expected that if these are deemed to be significantly contaminated they will be subject to remediation and validation which may involve post-remediation vapour and ground gas monitoring. Requirement for the installation of ground gas and vapour protection measures within the proposed offices, welfare and laboratories is negated owing to the proposed modular construction and with the cabins being raised on plinths above the ground surface. The processing building, stockpile and metals sheds will be developed as large spaces with large doors that are frequently expected to be open. Such design proposed for offices and the operational areas will significantly reduce the potential to allow build-up of ground gases and vapours internally. Future maintenance workers will need to comply with Site rules and protocols which is likely to include the requirements of suitable training and the use of gas / vapour alarms for any confined space entry. This results in a ***low*** likelihood with a ***small*** severity and an overall ***minor*** effect to future Site users.

9.6.41 The overall significance in relation to the operational phase and risks to human health is considered as ***not significant***.

Potential Impact on Controlled Waters

9.6.42 Hardstanding cover across the operational areas of the Site and drainage via a surface water drainage system would reduce infiltration of rainwater through the ground. This, in turn will reduce the potential for mobilisation of any residual contaminants which may remain within the soils following remedial works.

9.6.43 The drainage strategy includes collection of surface water from operational areas which will be collected via bunded tanks and utilised to dampen stockpiles and wash down plant areas. Outside of the operational areas, overflow runoff, and runoff from the car park/office area (i.e. the main site entrance), will be directed to Royles Brook via the existing surface water system. Residual water from operation of the wheel wash will be collected and stored within a designated aboveground tank which will then be recirculated and topped up with mains supply as necessary.

9.6.44 The Site is not located within a Source Protection Zone, there are no groundwater abstractions for drinking water within the surrounding area. Groundwater within the generally cohesive superficial deposits is also confined to lenses or horizons of granular soils.

9.6.45 Any surface or foul water drainage will be subject to appropriate treatment prior to discharge. The Environmental Permit will stipulate allowable discharge volume and associated monitoring requirements and contaminant threshold limits.

9.6.46 The potential for the exposure pathway would be a ***low*** likelihood, with resulting ***small*** severity/magnitude of impact and with ***minor*** effects.

9.6.47 The overlying superficial deposits have a very low to low permeability which significantly inhibit the transmission of groundwater and / or contaminants into the deeper Secondary B bedrock aquifer (Kirkham Mudstone Member) which covers the southeastern third of the Site. The potential for any pollutant linkages to the deeper bedrock aquifer is therefore ***unlikely*** with ***small*** severity of impact and ***negligible*** effects.

9.6.48 The perched groundwater within the made ground and superficial deposits are not considered to provide significant baseflow to the Royles Brook or River Wyre, however they may be in hydraulic continuity during high tide.

9.6.49 The Proposed Development will operate under an Environmental Permit which will require the storage of bulk chemicals and fuels within bunded areas and where storage tanks hold 110% volume. There will be no belowground fuel pipework as all pipes will be aboveground. An oil interceptor will be included within the surface water management system associated with the car parking. The potential for any pollutant linkages is therefore ***unlikely*** with resulting ***negligible*** magnitude and ***negligible*** effect.

9.6.50 Overall, the operation phase and risks to controlled waters is considered as **not significant**.

Potential Impacts on Property

9.6.51 Samples of soil and groundwater will be obtained for analysis of pH, sulphates and pyritic conditions which will be assessed to determine the required ACEC and DS for below ground concrete. This will be adopted by the designer to ensure the appropriate concrete specification is used. The likelihood of a contaminant linkage arising through concrete failure through inappropriate specification is ***unlikely*** with a ***negligible*** magnitude and resulting ***negligible*** effects.

9.6.52 Elevated concentrations of the ground gas carbon dioxide and elevated VOCs may be present within the Site soils. A ground gas and VOC monitoring programme and assessment will be undertaken during the Site Investigation phase. Post-remediation assessment following the removal of any significant sources, if identified, will determine whether any standard mitigation measures to be incorporated into the design of the building are required. A piling risk assessment will be undertaken following remedial works to remove significantly impacted soils and perched groundwater during preparatory works. The need for ground gas and vapour protection within the offices is negated owing to the proposed modular construction and with the cabins being raised on plinths above the ground surface. The risks from the ingress and accumulation of ground gas / VOCs into the Proposed Development is considered as ***low*** with a resulting ***small*** severity/magnitude of impact and ***low*** effect.

9.6.53 The overall significance in relation to the operational phase and risks to potential impacts on property is considered as ***not significant***.

Potential Impacts on Ecology & Ecosystems

9.6.54 Potential impacts on the Royles Brook and River Wyre, and their associated ecosystems, have been considered above under controlled waters.

Decommissioning Phase

9.6.55 A temporary compound area either on Site or immediately adjacent will be constructed to service the decommissioning phase. Akin to the construction phase, the compound area would house modular office and welfare facilities on existing made ground surface and / or existing slabs. This will be removed upon completion of the decommissioning works.

9.6.56 The storage of fuels or chemicals required during the decommissioning phase will be limited to diesel generators to provide power to the compound area and above ground diesel and ad blue tanks for re-fuelling dedicated plant. Such fuel storage would be housed appropriately and bunded, refuelling would be limited to designated re-fuelling areas and a suitably stocked spill-kit will be retained within the compound areas as part of a standard construction compound requirement. The fuel tanks used during the operational phase may be utilised before they are decommissioned.

9.6.57 Where belowground infrastructure is to be decommissioned and removed, groundwater management and dewatering practices would be adopted where groundwater is encountered. This may include a series of cut-off trenches and pumping employing best engineering practices.

9.6.58 A CEMP will be prepared to support the decommissioning phase. This will detail proposals to prevent the generation and runoff of silty or otherwise contaminated water to the Royles Brook or the other nearby watercourses during the decommissioning phase. This will include monitoring of the adjacent surface waters for a series of related contaminants at a specified location downstream of the Site. The CEMP shall also adopt dust management and good housekeeping practices to ensure the generation and migration of dust, litter and debris is kept to a minimum.

Sensitivity of identified receptors

9.6.59 The sensitivity of the receptors during the Decommissioning Phase, with reference to Table 9.9, are summarised below:

Table 9.9 Sensitivity of Identified Receptors During Decommissioning Phase

Receptor	Sensitivity	Comment
Ground Workers during the decommissioning and demolition phases	Low to High	Low - Removal of aboveground infrastructure only with no demolition;

		Medium to high – removal of belowground infrastructure and backfilling. Demolition of infrastructure
Existing Site Users of Adjacent Land	Low to High	Low – adjacent industrial premises High – members of public using Public Right of Way (located along embankment of Wyre Estuary)
Groundwater (superficial)	Low	Underlying Tidal Flat Deposits / Glacial Till unproductive strata, not located within a Source Protection Zone. Groundwater anticipated to be brackish and tidal.
Groundwater (bedrock)	Medium to Low	Only shallow belowground infrastructure will be removed during Site decommissioning and any deep piles will be left in-situ. The Kirkham Mudstone Member is a Secondary B aquifer. The Preesall Halite Member is an unproductive aquifer
Surface waters (Royles Brook / Hillylaid Pool / River Wyre)	Low	River Wyre has a WFD classification of poor.
Property/building	Low	Buildings and infrastructure to be decommissioned.
Wyre Estuary SSSI / SPA	High	River Wyre is classed as SSSI, an SPA, conserved wetland area, marine conservation site and Ramsar site.

Potential Impacts on Human Health During Decommissioning (includes groundworks)

9.6.60 Demolition workers during the decommissioning phase could be exposed to contamination associated with the operational industrial activities during disturbance of ground. Potential exposure routes are via inhalation, ingestion and / or dermal contact with contaminated soils, soil dusts, water and / or gases / vapours.

9.6.61 Investigation of the Site will be undertaken following cessation of the industrial operations. This will be required as a matter of course as per the environmental permit. This will be undertaken to ensure contamination of the Site has not occurred during the industrial operations.

9.6.62 The likelihood of exposure of demolition workers is therefore considered to be ***low likelihood to likely*** although with embedded mitigation***,*** the resulting severity is ***small*** and the overall scale of the contaminant risk effect is ***minor.***

9.6.63 Demolition works, particularly during ground disturbance activities, is likely to result in the generation of dust and debris in the absence of mitigation measures. Decommissioning and demolition works, will, however be completed in accordance with a CEMP. This will include dust suppression measures to be employed during potential dust generating activities including building demolition and ground disturbance, disturbance and excavation of Site-soils and processing of Site-generated hardstanding as part of preparatory works. As part of confined space protection measures, any staff entering confined spaces will have been given suitable training and will wear gas alarms and VOC monitoring will be employed where necessary.

9.6.64 The likelihood of such residual contamination being present and exposure to demolition workers and neighbouring users occurring when the incorporated mitigation measures are implemented is considered as ***low*** with the resulting severity as ***small*** with the overall scale of the contaminant risk effect is ***minor***.

Potential Impact on Controlled Waters

9.6.65 A Forward Control Plan (similar to that produced for the previous Site demolition works) will be produced and implemented to ensure that silty and otherwise contaminated water does not enter the Royles Brook and is stopped using the control valves at the penstock on the discharge outlet. This will include monitoring of the water to ensure it does not exceed threshold limits as set by the EA. The control plan will also include environmental pollution emergency response protocol which should be implemented in the event of a pollution incident on Site.

9.6.66 Decommissioning of the aboveground fuel and chemical tanks will be undertaken in accordance with Building Regulations whereby the tanks and pipework will be emptied and de-gassed by a specialist company and removal of pipework and the bund will be subject to validation of remaining soils and removal of any significantly impacted groundwater.

9.6.67 The likelihood of contamination occurring during the decommissioning phase and when the incorporated mitigation measures are implemented is considered as ***low*** with the resulting severity as ***small*** with the overall scale of the contaminant risk effect is ***minor***.

9.6.68 The potential impact to groundwater within bedrock is considered **unlikely**. This, together with a **small** severity/magnitude gives an overall **minor** effect.

Potential Impacts on Property

9.6.69 The decommissioning phase will include the removal of all buildings and aboveground infrastructure and making any belowground infrastructure safe. This will be undertaken in accordance with requirements of the environmental permit and planning approval.

9.6.70 Any works required within 8m of the Royles Brook will be undertaken in accordance with an authorised FRAP and will be subject to geotechnical assessment to ensure the stability of banks are not compromised.

9.6.71 With implementation of embedded mitigation measures, the likelihood of potential impacts on property, infrastructure and ground stability during the decommissioning phase are ***unlikely*** with the resulting severity as ***small*** with the overall scale of the contaminant risk effect is ***negligible***.

Potential Impacts on Ecology & Ecosystems

9.6.72 Potential impacts on the River Wyre, and hence associated ecosystems, have been considered above, under controlled waters.

9.6.73 The overall significance in relation to the decommissioning phase and risks to human health, impacts on controlled waters, property and stability plus ecology when design mitigation measures and further required investigation and remediation of impacted soils / groundwater (as required) is accounted for, is considered ***not significant***.

9.7 Cumulative Effects

9.7.1 At present no developments have been identified which could give rise to likely significant environmental effects with respect to having a significant contamination impact on ground conditions. It is noted that Hillhouse Enterprise zone has a long heavy industrial history, much of which, has now ceased operation and has been decommissioned.

9.8 Mitigation

9.8.1 The above assessment takes account of the mitigation measures, which encompass physical measures incorporated within the design of the Proposed Development, and additional management controls that would be required under the Environmental Permit for the facility.

9.8.2 The assessment also considers additional mitigation measures which will be employed as per the recommendations outlined within the existing Phase 1 Geo-Environmental Desk Based Assessment and that which would require to be implemented to ensure compliance with LCRM.

9.8.3 A Site Investigation involving intrusive works will be required under LCRM. It is possible that this may be followed by the requirement of a Remediation Strategy although this will be further advised by the recommended investigation works.

9.8.4 The additional mitigation measures which would be adopted during the construction and operational phases of the Development are described below.

Construction Phase

9.8.5 The Site would be subject Site Investigation and quantitative risk assessment or prior to the commencement of construction. These would include:

- Site Investigation to include both shallow and deeper boreholes plus a series of trial pits;
- collection of representative soil and shallow groundwater samples for contamination and geotechnical testing to inform remedial requirements and development design; and,
- Completion of a programme of ground gas and vapour monitoring followed by a gas risk assessment to inform remedial requirements and development design.

9.8.6 Should the contamination assessment reveal any potentially significant contaminant linkages, then the findings would be used to inform a Remediation Strategy. Once prepared and agreed with the Local Authority and other regulators / consultees,. the strategy would take into account the likely requirements of the Site development, including technical, commercial, practical and sustainability issues. These requirements make it essential to retain and reuse all useful engineering materials within the Site where practicable, whilst removing all unacceptable materials if present. The strategy would be informed by further assessments, however as a minimum it is considered this will include Removal of hardstanding and sub-surface structures (to a nominal depth of 1.2mbgl).

9.8.7 Remedial works would be undertaken, including the removal of unacceptable contamination. A piling risk assessment to be undertaken to inform the piling methodology. This may also be required where excavations are to be made. Both the assessment and reporting would be undertaken in accordance with LCRM.

9.8.8 The geotechnical investigation would be carried out in accordance with the design brief produced by an experienced engineer. The Designer would identify construction methods that would mitigate any adverse effects relating to ground stability. Depending on the proposed foundation type, a piling risk assessment in accordance with EA Guidance[10] may be required.

9.8.9 Deep excavations are not considered to be required under current development proposals and would be limited to piling of the processing and stockyard sheds only.

9.8.10 Groundwater management is anticipated to be limited and should be manageable by conventional dewatering means.

9.8.11 Fuel for plant and machinery will be stored in appropriately bunded or containment areas within a dedicated re-fuelling area. Fuel storage and re-fuelling areas should not be located within area of piling operations or excavations.

9.8.12 The Site investigation will involve ground gas and VOC monitoring within installed boreholes where excavations and piling are to be undertaken as part of the proposed development.

9.8.13 The offices will be containerised cabins and on struts above the ground hence will no warrant ground gas or vapour protection.

[10] *Environment Agency. (2001). Piling and Penetrative Ground Improvements on Land Affected by Land Contamination. NC/99/73.*

Operational Phase

9.8.14 No significant adverse impacts and effects for the operational phase of the development have been identified with regards to land contamination. No additional mitigation measures above and beyond those incorporated and implemented during the construction phase to protect the development, end users and local environment from risks associated with land contamination would be necessary during the operational phase.

9.8.15 As per the construction phase, the Site Investigation and contamination risk assessment to include an assessment of soils, groundwater gases, VOCs together with a geotechnical investigation would provide the required data for a suitably qualified and experienced structural engineer to design a robust foundation and sub-surface structure design. Appropriate design and implementation would mitigate against the risk of building instability during the operational phase. Such a design would also encompass the findings and recommendations made by the appointed consultant in respect to the Site's assumed shallow groundwater regime and its management during excavation / construction works, which may extend to or below the water table.

Decommissioning Phase

9.8.16 Similar measures as required for the construction phase will be implemented during the decommissioning phase which may involve demolition activities. Validation of any decommissioned facilities, particularly below ground, will be undertaken to ensure that there is no residual significant contamination remaining.

9.9 Residual Effects

9.9.1 Additional investigation and assessment would be undertaken prior to construction to confirm the specific details of mitigation measures required. These primarily relate to a supplementary investigation of ground bearing strata and groundwater risk assessment to determine the requirements for foundation design, removal of impacted soils and groundwater management during excavations. A Remediation Strategy would be produced based on the findings of the existing Site Investigation and supplemented by any further investigation and assessment to outline remedial works regarding contamination. The scope of the additional investigations, assessments, proposed remedial measures along with the findings and conclusions, would be agreed with the Local Authority, EA and other stakeholders as necessary.

9.9.2 The implementation of standard best working practices and mitigation measures would be necessary to minimise any residual risk from ground contamination following the completion of preparatory remedial works during the construction phase. Providing the required mitigation measures are strictly employed, the overall significance in relation to ground and groundwater conditions during the construction phase is considered ***not significant.***

9.9.3 Upon completion of the Proposed Development, the overall significance in relation to ground and groundwater conditions during the operational phase is considered as ***not significant*****.**

Table 9.9 –Residual Effects

Receptor & Sensitivity	Potential Impact	Likelihood of Contaminant Linkage (with embedded mitigation)	Impact Magnitude	Resulting Effects	Mitigation	Residual Effect
Construction Phase						
Construction Workers (Medium to High)	Moderate ground disturbance anticipated including piling. Extensive Made Ground across the Site. Contamination within Ground and Perched groundwater above corresponding threshold limits is anticipated within select areas.	Low to Likely	Small	**Minor**	Site investigation including assessment of soils and perched groundwater, plus ground gases and VOCs. Remedial strategy (as required) to involve the removal and validation of significantly impacted soils and perched groundwater as necessary. Ground gas and vapour monitoring where deep excavations and piling is proposed. Followed by associated risk assessment Provision of a CEMP. Asbestos survey followed by removal by a suitably licensed contractor to be undertaken prior to demolition and ground disturbance. Confined Space entry training and mitigation. Use of gas and vapour alarms as required. Piling risk assessment with implemented mitigation as required.	**Negligible**
Existing Site Users of Adjacent Land (Low to High)	Dust and debris to adjacent users of Public Right of Way along embankment between Site and Wyre Estuary	Low	Small	**Minor**	CEMP to include dust and debris suppression measures Site investigation including assessment of soils and perched groundwater, plus ground gases	**Negligible**

	and to adjacent Site users of nearby industrial premises.				and VOCs. Remedial strategy (as required) to involve the removal and validation of significantly impacted soils and perched groundwater as necessary	
Groundwater (superficial) (Low)	Underlying Tidal Flat Deposits / Glacial Till unproductive strata, not located within a Source Protection Zone. Groundwater anticipated to be brackish and tidal.	Low	Small to Negligible	**Minor**	Site investigation including assessment of soils and perched groundwater. Remedial strategy (as required) to involve the removal and validation of significantly impacted soils and perched groundwater as necessary. Piling risk assessment with implemented mitigation as required.	**Negligible**
Groundwater (bedrock) (Medium to Low)	The Kirkham Mudstone Member is a Secondary B aquifer. The Preesall Halite Member is an unproductive aquifer	Low	Small	**Minor**	Site investigation including assessment of soils and perched groundwater. Remedial strategy (as required) to involve the removal and validation of significantly impacted soils and perched groundwater as necessary. Piling risk assessment with implemented mitigation as required.	**Negligible**
Surface waters (Royles Brook / Hillylaid Pool / River Wyre) (Low)	River Wyre has a WFD classification of poor.	Low	Small	**Minor**	Site investigation including assessment of soils and perched groundwater. Remedial strategy (as required) to involve the removal and validation of significantly impacted soils and perched groundwater as necessary. CEMP to include measures to control and monitor the generation of silty and otherwise contaminated run-off to enter watercourses. Discharge consent to be obtained from EA as necessary. CEMP to include environmental emergency protocol should a pollution incident occur during construction phase.	**Negligible**
Property/Building (Low)	Building remaining on Site is to be demolished as part of the proposed development and relict foundations of previous	Unlikely	Small to Medium	**Minor**	Any proposed works within 8m of the bank of the Royles Brook to be assessed for geotechnical and contamination risks and a FRAP to be obtained from the EA.	**Negligible**

	industrial operations are to be removed where required.				No works proposed on or within the close vicinity of existing embankments/bunds unless geotechnical stability assessment is undertaken. Site investigation to include sufficient geotechnical information to inform development design. Concrete classification of belowground concrete to be assessed and determined based on findings during site investigation. Water pipeline risk assessment utilising site investigation or post -remediation data to inform design where belowground water supply pipes are proposed.	
Wyre Estuary SSSI / SPA (High)	River Wyre is classed as SSSI, an SPA, conserved wetland area, marine conservation site and Ramsar site.	Unlikely	Small to Medium	**Minor**	CEMP to include dust and debris suppression measures and emergency environmental protocol should a pollution incident to surface water arise. Direct discharges to Wyre Estuary are unlikely during construction phase.	**Negligible**
Operational Phase						
Future Site Users (Low)	Disturbance of ground during the operational phase is expected to be minimal. Ground will be covered with hardstanding and buildings across all operational areas. Bunds and the proposed strip of soft landscaping alongside the footpath are	Unlikely to Low	Small	**Minor**	Operational areas of Site to be fully covered with either buildings, hardstanding or hardcore hence risk of direct contact pathways are negligible. Gas and VOC assessment to be included within the Site investigation to inform remedial measures / design requirements. The proposed strip of soft landscaping and bunds surrounding the Site will be used only infrequently. Import of topsoil and subsoils to the Site to construct the soft landscaping	**Negligible**

	expected to be used only infrequently.				should be a minimum, thickness of 350mm of clean, validated soils to break potential direct contact pathways to the underlying soils and perched water. All officing, welfare and laboratories to be constructed as modular containerised/portacabin builds on struts located aboveground. Hence risk of build-up of ground gas and vapours is minimal. Confined space entry protocols to be used where required by future site maintenance operators working within belowground entries.	
Existing Site Users of Adjacent Land (Low to High)	Low – adjacent industrial premises High – members of public using Public Right of Way (located along embankment of Wyre Estuary)	Unlikely to Low	Small	**Minor**	Operational areas of Site to be fully covered with either buildings, hardstanding or hardcore hence risk of direct contact pathways are negligible. Site to operate via an environmental permit which will set out the required measures to prevent and monitor the potential dust and debris generation.	**Negligible**
Groundwater (superficial) (Low)	Underlying Tidal Flat Deposits / Glacial Till unproductive strata, not located within a Source Protection Zone. Groundwater anticipated to be brackish and tidal.	Low	Negligible	**Negligible**	All fuel and chemical tanks are to be aboveground and be bunded with a 110% capacity of the largest tank. All associated pipework will be aboveground. Fill points are to be gauged and to be located within the bund. Drip trays to be utilised for any mobile fuel tanks. Spill kits to be fully stocked and present within appropriate areas of the Site. Environmental Permit to be sought from the EA and implemented during Site operation.	**Negligible**
Groundwater (bedrock) (Medium to Low)	Medium - The Kirkham Mudstone Member is a Secondary B aquifer.	Unlikely	Small	**Negligible**	Piling mitigation measures to be incorporated as required by the piling risk assessment. Owing to the cohesive nature of the superficial deposits (Tidal Flat Deposits and Glacial Till),	**Negligible**

	Low - The Preesall Halite Member is an unproductive aquifer				the bedrock should remain unaffected during site operation.	
Surface waters (Royles Brook / Hillylaid Pool / River Wyre) (Low)	River Wyre and Royles Brook/Hillylaid Pool has a WFD classification of poor.	Low	Small	Minor	Discharges of surface waters from Site operations will be consented by the EA. Monitoring will be undertaken as per the requirements of the discharge consent prior to controlled discharge Penstocks will be in place to ensure that any discharge failing consented thresholds is not released into surface waters. Foul water will be subject to appropriate treatment (including removal of suspended solids and treatment via UV light etc). before being captured and sprayed onto material stockpiles or uplifted tankered off Site for treatment and disposal by a suitably licensed contractor.	**Negligible**
Property/Building (Low)	Industrial in nature Medium - large processing building and stockyard shed Low – officing, laboratory and welfare facilities constructed as a modular build on struts raised above the ground.	Unlikely	Negligible	**Negligible**	Detailed Design will ensure the development is suitable for operation and maintenance/servicing is undertaken at the required intervals.	**Negligible**
Wyre Estuary SSSI / SPA (High)	River Wyre is classed as SSSI, an SPA, conserved wetland area, marine conservation site and Ramsar site.	Unlikely	Small to Medium	**Minor**	An environmental permit will be in place for the Site operations along with relevant discharge consents.	**Negligible**

Decommissioning Phase						
Ground Workers during the decommissioning and demolition phases (Low to High)	Sensitivity is dependent upon activities: Low - Removal of aboveground infrastructure only with no demolition; Medium to high – removal of belowground infrastructure and backfilling. Demolition of infrastructure	Low	Small	**Minor**	Environmental Management Plan (EMP) for the decommissioning phase to be prepared and implemented. EMP to include measures to control discharges from Site and a protocol to deal with pollution incidents including decommissioning, purging, cleaning tanks and pipework etc, prior to demolition/removal works.	**Negligible**
Existing Site Users of Adjacent Land (Low to High)	Low – adjacent industrial premises High – members of public using Public Right of Way (located along embankment of Wyre Estuary)	Low	Small	**Minor**	EMP to include measures to suppress generation of dust and debris.	**Negligible**
Groundwater (superficial) (Low)	Underlying Tidal Flat Deposits / Glacial Till unproductive strata, not located within a Source Protection Zone. Groundwater anticipated to be brackish and tidal.	Low	Small	**Minor**	Groundwater within the superficial is unlikely to be affected should only above ground buildings and infrastructure be dismantled and removed from Site but if below ground infrastructure is to be removed, then the infrastructure will need to be fully decommissioned before it is removed and may require validation of surrounding soils and perched groundwater.	**Negligible**
Groundwater (bedrock) (Medium to Low)	The Kirkham Mudstone Member is a Secondary B aquifer.	Unlikely	Small	**Minor**	Groundwater within the bedrock is unlikely to be affected during decommissioning. Any deep piles will be left insitu.	**Negligible**

	The Preesall Halite Member is an unproductive aquifer					
Surface waters (Royles Brook / Hillylaid Pool / River Wyre) (Low)	River Wyre has a WFD classification of poor.	Low	Small	**Minor**	EMP to include measures to prevent run off of silty or otherwise contaminated water and control measures to deal with pollution incidents. Stockpiles of materials and wastes to be appropriately managed to prevent the generation of dusts and debris.	**Negligible**
Property/building (Low)	Buildings and infrastructure to be decommissioned.	Unlikely	Small	**Minor**	Buildings and infrastructure to be removed/decommissioned. If works are proposed within 8m of the Royles Brook then a stability assessment will be required along with application of a FRAP.	**Negligible**
Wyre Estuary SSSI / SPA (High)	River Wyre is classed as SSSI, an SPA, conserved wetland area, marine conservation site and Ramsar site.	Unlikely	Small to Medium	**Minor**	EMP to include measures to suppress generation of dusts and debris, prevent run off of silty or otherwise contaminated water and control measures to deal with pollution incidents.	**Negligible**

9.10 Conclusions

9.10.1 This ground conditions Chapter has considered the potential impacts that may arise at sensitive receptors during the construction, operational and decommissioning phases of the Proposed Development.

9.10.2 A baseline assessment has been completed to qualitatively characterise the identified source-pathway-receptors with regards to the current status of the Site to support this ground conditions and contamination assessment. This assessment has concluded that isolated areas of contaminated soils and impacted perched groundwater are expected.

9.10.3 An intrusive investigation will be undertaken in due course to quantitatively assess the Conceptual Site Model that has been generated as part of the baseline assessment.

9.10.4 Depending upon the outcome of an intrusive investigation for the Site, remedial recommendations may be required. Should this be the case, then a Remedial Options Appraisal, Remediation Strategy and verification implementation plan would duly be produced, all in line with the requirements of LCRM.

9.10.5 At this stage, it is considered that such remedial works may include the removal of significantly contaminated soils for either off-Site disposal or treatment and reuse, and the use of design mitigation measures including implementation of a materials management plan and, potentially ground gas / VOC protection measures within the development, if necessary.

9.10.6 The required mitigation measures to be employed during the construction phase would be set out in the CEMP to be agreed in advance with the Local Authority and EA. Similarly, in advance of any decommissioning, mitigation measures will be specified within an associated Environmental Management Plan which will be agreed by regulatory authorities.

9.10.7 Throughout the implementation of incorporated and additional mitigation measures there would be ***no significant*** residual effects on human health, controlled waters, ecological receptors or buildings/ground stability during the construction phase.

9.10.8 The facility is to be operated under an Environmental Permit, and on the basis of the development as proposed, ***no significant*** residual effects on human health, controlled waters, ecological receptors of building during the operational phase have been identified.

9.10.9 Overall, the effects are predicted to be ***not significant*** with respect to ground conditions and contamination and no significant residual effects have been identified.

ES Appendix 9.1 – Phase 1 Geo-Environmental Assessment for Hillhouse IBA (SGP, July 2024)

Hillhouse IBA Processing Facility

Environmental Statement

Chapter 10.0 – Surface Water and Flood Risk

Prepared for

Fortis IBA Ltd

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TABLES

APPENDICES

10.0 SURFACE WATER AND FLOOD RISK

10.1 Introduction

10.1.1 This Chapter assesses the potential impacts of the Proposed Development on the water environment, and the likely significance of such impacts during the construction, operational and decommissioning phases.

10.1.2 The Chapter addresses the following receptors:

i) Surface Water (watercourses, reservoirs, lakes, ponds and wetlands);
ii) Flood risk management;
iii) Land drainage; and
iv) Infrastructure - wastewater treatment and sewerage.

10.1.3 The Chapter describes the methods used to assess the likely significant effects; the baseline conditions that exist at the Site and within the surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.

10.1.4 This Chapter and the accompanying Flood Risk and Drainage Assessment report (ES Appendix 10.1) have been prepared in accordance with relevant key legislation, policy and guidance documents, including the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG).

Competence

10.1.5 This Chapter of the ES has been prepared by Weetwood Services Limited (“Weetwood”).

10.1.6 Weetwood is a leading independent consultancy specialising in flood risk, drainage and water management serving the development industry across the UK. Weetwood has undertaken numerous EIAs in relation to the water environment to support a range of developments.

10.1.7 This Chapter has been written by Rebecca Murphy BSc (Hons). Rebecca is an Associate Director at Weetwood and has over 18 years of experience working in the water environment, which includes a 2 year secondment at the Environment Agency. Rebecca has extensive experience of managing and co-ordinating both small and large scale projects and has produced various ES Chapters in support of a range of proposed developments and planning submissions including strategic development sites.

10.2 Methodology

Legislation and Guidance

10.2.1 In preparing this Chapter, a wide range of national legislation and policy guidance documents relevant to the assessment have been considered as listed in Table 10.1.

Table 10.1 – Relevant Key Legislation, Policies and Guidance Documents

Context	Legislation, Policies and Guidance Documents
National	The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017)
	National Planning Policy Framework (updated December 2023)
	Planning Practice Guidance (updated February 2024)
	Water Industry Act (1991)
	Water Act 2003 (as amended)
	Flood and Water Management Act (2010)
	National Flood and Coastal Erosion Risk Management Strategy for England, Environment Agency (2020)
	Control of Pollution (Oil Storage) (England) Regulations (2001)
	Surface Waters [Dangerous Substances (Classification)] Regulations (1998)
	Control of Substances Hazardous to Health (COSHH) Regulations (2002)
	Environment Act 1995 (as amended)
	Surface Water (River Ecosystem) (Classification) Regulations (1994)
	Land Drainage Act 1991 (as amended)
	Food and Environment Protection Act (1985)
	Making Space for Water – Taking Forward a New Government Strategy for Flood and Coastal Erosion Risk Management in England, DEFRA (2005)
	Sustainable Drainage Systems (SuDS): Non-statutory Technical Standards for SuDS, DEFRA (2015)
	House of Commons Written Statement on SuDS (HCWS161) (2014)
	The Building Regulations - Drainage and Waste Disposal, Approved Document H, HM Government (published in 2010, amended 2015)
	TAG Unit A3 Environmental Impact Appraisal, Department for Transport (2014)
	Guidance on the Construction of SuDS (C768), CIRIA (2017)
	The SuDS Manual (C753), CIRIA (2015)
	SuDS: Hydraulic, Structural and Water Quality Advice (C609), CIRIA (2004)
	Control of Water Pollution from Construction Sites (C532), CIRIA (2001)
	Infiltration Drainage – Manual of Good Practice, CIRIA Report 156 (1996)
	Control of Pollution from Highway Drainage Discharges, CIRIA Report 142 (1994)
	Code of Good Agricultural Practice for the Protection of Water, DEFRA (1998 as amended 2002)
	Guidelines for the use of herbicides on weeds in or near watercourses and lakes, CIRIA (1995)

	Sewerage Sector Guidance Appendix C - Design and Construction Guidance v2.0 (2020)
County and Local	Wyre Local Plan 2011 - 2031 (incorporating a partial update of 2022), Wyre Council, adopted January 2023 (inc. Policy CDMP2 and SA4)
Other Sources of Information	Local Flood Risk Management Strategy for Lancashire 2021 - 2027, Lancashire County Council
	Level 2 Strategic Flood Risk Assessment: Flood Risk Sequential Test Paper, Wyre Council, August 2017
	Level 2 Strategic Flood Risk Assessment, Wyre Council, October 2016
	Level 1 Strategic Flood Risk Assessment, Wyre Council, July 2016
	North West River Basin District River Basin Management Plan, Environment Agency, December 2015
	Preliminary Flood Risk Assessment, Lancashire County Council, May 2011
	North West England and North Wales Shoreline Management Plan, July 2010
	River Wyre Catchment Flood Management Plan, Environment Agency, December 2009
	Websites for Government, DEFRA and British Geological Survey

National Legislation and Planning Policy

10.2.2 The Water Framework Directive (WFD) provides a legal framework for the protection, improvement and sustainable use of inland surface waters, groundwater, transitional waters, and coastal waters across England. The WFD seeks to achieve at least 'good' status for all waterbodies.

10.2.3 Under the WFD, development must not result in any deterioration in the status of a waterbody nor compromise the aims of the WFD as set out in the River Basin Management Plans, for which the Environment Agency is the 'competent authority'.

10.2.4 The Flood and Water Management Act 2010 implements several key recommendations of Sir Michael Pitt's Review of the Summer 2007 floods.

10.2.5 The NPPF sets out the government's planning policies for England and how these are expected to be applied.

10.2.6 The NPPF guides local planning authorities and decision-takers both in drawing up plans and as a material consideration in determining applications. It includes policies to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas of highest risk (para. 165 of the NPPF). In exceptional circumstances where new development is necessary in areas at risk of flooding, the policy aims to make it safe, without increasing flood risk elsewhere, and, where possible, reducing flood risk overall (para. 169 - 170 of the NPPF).

10.2.7 The NPPF advocates the use of the risk-based Sequential Test to steer new development to areas at lowest probability of flooding. It also matches the flood risk vulnerability of a development proposal to appropriate flood zones and provides details on how to include the potential effects of climate change on development.

10.2.8 The NPPF states that major developments should incorporate SuDS to appropriate operational standards and with maintenance arrangements in place unless there is clear evidence that this would be inappropriate (para. 175 of the NPPF).

10.2.9 The NPPF is accompanied by the PPG, which provides additional guidance to ensure the effective implementation of the policy set out in the NPPF.

Local Planning Policy

10.2.10 Policy CDMP2 of the Wyre Local Plan 2011 - 2031 sets out the Councils requirements for flood risk and surface water management. This states that *"development will be required to demonstrate that; it will not be at an unacceptable risk of flooding; and, it would not lead to an increased risk of flooding elsewhere; and it would not adversely affect the integrity of tidal and fluvial defences or access for essential maintenance and emergency purposes"*.

10.2.11 Policy CDMP2 also states that *"major category development will be expected to include proposals for, and implement [SuDS] utilising lower lying land within the site, existing natural water features and other above ground measures for the management of surface water at source, unless demonstrated to be inappropriate"*.

10.2.12 Policy SA4 of the Wyre Local Plan 2011 – 2031 provides key development considerations specifically for Hillhouse Technology Enterprise Zone including the requirement for the incorporation of flood risk mitigation measures to ensure that the Enterprise Zone is safe for the lifetime of the development, the sequential approach to site layout and the management of residual surface water runoff.

Assessment Methodology

10.2.13 The presence, location and quality of surface water bodies at and within the vicinity of the Site and the risk of flooding from known sources have been assessed utilising Ordnance Survey, Government, Environment Agency and British Geological Survey data and mapping, and the other sources of information listed in Table 10.1. The assessment of flood risk has also been informed by a topographic survey of the Site and LiDAR data.

10.2.14 In accordance with national and local planning policy and guidance (as set out in Table 10.1), and based upon professional experience and judgement, a package of measures to mitigate flood risk has been developed to ensure that the Proposed Development will be safe from flood risk for its lifetime, taking climate change and the vulnerability of its users into account.

10.2.15 A strategy for the management of surface water runoff has also been developed in accordance with planning policy and technical standards and the requirements of the WFD. The strategy has been informed by an assessment of the existing drainage regime at the Site utilising the topographic survey and LiDAR data, in addition to the geology mapping to define the underlying ground conditions. This information has in turn been utilised to inform the proposed means of storing and re-using water onsite, prior to the need to dispose of surface water runoff from the Proposed Development

10.2.16 To support the planning application, a site-specific Flood Risk and Drainage Assessment report has been prepared and is included as ES Appendix 10.1. The baseline assessment and outcomes of the Flood Risk and Drainage Assessment have informed this Chapter.

Scope of Assessment

10.2.17 The scope of the assessment has been based upon a review of available desktop information within the study area to identify the baseline conditions and development receptors. This has been supported by detailed assessments where necessary / required as detailed within this Chapter.

10.2.18 Consultation has been undertaken with the Environment Agency, Wyre Council (local planning authority) and Lancashire County Council (lead local flood authority). Details of the consultations are outlined within the Flood Risk and Drainage Assessment report (ES Appendix 10.1).

Assessment of Significance / Assessment Criteria

10.2.19 Informed by the baseline assessment, surface hydrology receptors of potential environmental effects have been identified (Table 10.5). The ‘importance’ of each receptor has been identified using professional judgement and by reference to the guidance criteria presented in Table 10.2.

10.2.20 The magnitude of change and potential significant effects on each receptor have been identified using the criteria presented in Table 10.3, informed by the baseline assessment, professional experience and stakeholder consultation.

10.2.21 Identified effects may be significant at the level of importance defined for the receptor, or at a lesser geographical scale. For example, limited effects on a watercourse of regional value might be assessed as being significant at a local authority level. Thus, the significance of effects has been determined from the importance of the receptor, the magnitude of the change and, where appropriate, the likelihood of the effect occurring using the effect significance matrix presented in Table 10.4.

10.2.22 Potential effects may be assessed to be adverse or beneficial. For the purposes of this assessment, a significant effect has a moderate magnitude or above in Table 10.4.

10.2.23 Mitigation measures have been developed for identified effects using technical guidance, best practices and professional experience. Where the significance of an effect (or effects) is assessed to be "Negligible", no mitigation measures are considered to be necessary.

10.2.24 The magnitude of effects following the application of the identified mitigation measures (i.e. the residual effect) has been assessed with reference to the extent, magnitude and duration of the impact and performance against environmental quality standards, again with reference to the criteria presented in Table 10.2 and Table 10.3. The significance of the residual (i.e. post mitigation) effects has been assessed as described above.

Table 10.2 – Estimating Receptor Importance

Importance	Criteria	Measures
Very High *National*	Receptor has a high quality and rarity on an international or national scale.	Surface Water: Designated Salmonid / Cyprinid fishery, high WFD ecological status, good WFD chemical status, protected under UK habitat legislation (e.g. Site of Special Scientific Interest, Water Protection Zone, Ramsar site), waterbodies important at a national scale. Flood Risk Management: Essential infrastructure land uses such as essential transport and utility infrastructure.

High *Regional*	Receptor has a high quality on a county or regional scale	Surface Water: Major Cyprinid fishery, good WFD ecological status, good WFD chemical status, species protected under UK habitat legislation, waterbodies important at a regional scale. Flood Risk Management: Highly vulnerable land uses such as emergency services, caravans, mobile homes and park homes intended for permanent residential use, basement dwellings and installations requiring hazardous substances consent.
Medium *Local Authority*	Receptor has a medium quality on a local or district scale	Surface Water: Moderate WFD ecological status, good WFD chemical status, waterbodies important at a local scale. Flood Risk Management: More vulnerable land uses such as hospitals, residential units, hostels/hotels, non-residential uses for health services and waste management sites.
Low *Site*	Receptor has a low quality and rarity on a local scale	Surface Water: Poor/Bad WFD ecological status, poor WFD chemical status, waterbodies important at a site scale. Flood Risk: Less vulnerable land uses such as water-compatible developments, retail, commercial and general industrial units, agricultural/forestry sites and water/sewage treatment plants.

Table 10.3 – Criteria for Estimating the Magnitude of Change on a Receptor

Magnitude	Criteria	Measures
Major	A considerable effect (by extent, duration or magnitude) of the receptor	Surface Water: Significant change in WFD class, significant change in pollution discharge that may result in removal of likelihood of polluting discharge occurring or loss or extensive change to a fishery and loss or extensive change to a designated Nature Conservation Site. Flood Risk Management: Significant effect on flood risk that may be an increase or decrease in flood depth, flood flow velocities or extent of flooding
Moderate	Limited effects to receptor	Surface Water: Moderate change in WFD class, moderate risk of pollution from a spillage, partial loss of productivity of a fishery. Flood Risk Management: Moderate change in flood risk that may be an increase or reduction in flood depth, flood flow velocities or extent of flooding
Minor	Some minor change to receptor	Surface Water: Minor change in WFD class, minor risk of pollution from a spillage. Flood Risk Management: Minor change in flood risk that may be an increase or reduction in flood depth, flood flow velocities or extent of flooding.
Negligible	Effect on receptor but of insufficient magnitude to affect the use or integrity	Surface Water: Negligible or no risk of pollution from a spillage. Flood Risk Management: Negligible change in flood risk.

Table 10.4 – Assessment of Significance Matrix

		Magnitude of Impact			
		Major	**Moderate**	**Minor**	**Negligible**
Importance of Receptor	**Very High**	Major	Moderate/Major	Minor/ Moderate	Negligible
	High	Moderate/ Major	Moderate	Minor	Negligible
	Medium	Minor/Moderate	Minor	Negligible	Negligible
	Low	Minor	Negligible	Negligible	Negligible

Limitations

10.2.25 An assessment of the potential effects of the developments has been undertaken utilising the best data, methods and scientific knowledge available at the time.

10.3 Baseline

Surface Water

10.3.1 The River Wyre is located approximately 60 m east of the Site and is tidally influenced.

10.3.2 Royles Brook flows in a south-easterly direction between the main site and the southern parcel. After passing beneath South Road, Royles Brook outfalls to a watercourse known as Hillylaid Pool, which discharges to the River Wyre, approximately 390 m to the south-east of the Site via Stanah pumping station

10.3.3 A watercourse referred to as Springfield flows in open channel and culvert approximately 1.1 km north / north-west of the Site and also outfalls to the River Wyre.

10.3.4 The Site is located within the catchment of the ''Hillylaid Pool - Main Dyke' water body (Water Body ID: GB112072066160). The water body has been assessed under the WFD. The current ecological status is 'Moderate', whilst the chemical status is 'Fail'.

10.3.5 The Site is also located adjacent to the 'Wyre' water body (Water Body ID: GB531207212200). The water body has been assessed under the WFD. The current ecological status is 'Poor', whilst the chemical status is 'Fail'.

10.3.6 There are no other WFD defined surface waterbodies within the vicinity of the Site or upon which the Proposed Development would impact.

Flood Risk Management

Historical Records of Flooding

10.3.7 The Environment Agency do not hold any records of historic flooding at the Site.

Flood Risk from the Sea (Tidal / Coastal) and Rivers (Fluvial)

10.3.8 The Environment Agency Flood Map for Planning (Figure 3 of the Flood Risk and Drainage Assessment report - ES Appendix 10.1) indicates the Site to be located in flood zone 3, which is defined as having a 'high probability' of flooding from rivers and / or the sea. This is reiterated on Figure 1.2 of the 2016 Level 2 Strategic Flood Risk Assessment ("Fluvial and Coastal Flood Zones").

10.3.9 Tidal flood defences are located to the north-west and south-east of the Site. The Environment Agency has advised that the defences comprise embankments with an effective crest level of 6.95 and 7.63 m AOD respectively. The embankments provide a 0.5% and 4% annual exceedance probability (AEP) standard of protection respectively and are in 'fair' condition. LiDAR data indicates that high ground is present along the north / north-western boundary of the Site and is at a level of 7.5 - 8.6 m AOD. It is assumed that the flood defences tie-in to the high ground to provide a contiguous defence.

10.3.10 Section 3.2.3 of the 2016 Level 2 Strategic Flood Risk Assessment states that *"there is a long-term aspiration to maintain existing defences and major assets to their current standard of protection and improve assets to an appropriate standard where they fail to meet their target condition"*.

10.3.11 At a regional level, the River Wyre Catchment Flood Management Plan and the Shoreline Management Plan, both propose policies to "hold the line" or to "take further action to reduce flood risk". At a local level, the Wyre Urban Core Strategy outlines the desired approach to flood risk management in the coastal peninsula, which includes the upgrade, maintenance and replacement of existing defences.

10.3.12 Overtopping of the existing tidal flood defences has been assessed as part of North West Region - Lancashire Tidal Areas Benefitting from Defences Revisited (January 2015) for the present day 0.5% and 0.1% AEP events. The 0.5% AEP event plus climate change was also assessed for the year 2069 (+0.37 m), 2115 (+0.67 m) and 2119 (+0.97 m).

10.3.13 The sea level rise considered for the 2069 scenario provides a conservative assessment of the 95th Percentile (95P) allowance derived in accordance with current climate change guidance published by the Government based upon the design life of the development of 25 years (i.e. to the year 2051 assuming an anticipated commission date of December 2026). This has therefore been utilised to assess the future flood risk to the Site.

10.3.14 The modelled defended (overtopping) outputs (Figure 4 of the Flood Risk and Drainage Assessment report - ES Appendix 10.1) indicate that no flooding of the Site or access would be expected in a present day 0.5% and 0.1% AEP event, and in a 0.5% AEP event plus climate change (2069 - 2051, 95P proxy).

10.3.15 A breach of the existing tidal flood defence to the south-east of the Site was assessed as part of the aforementioned modelling study for the present day 0.5% AEP event. The modelled output (Figure 5 of the Flood Risk and Drainage Assessment report - - ES Appendix 10.1) indicates that flooding of the Site would occur with a peak flood level of 6.22 m AOD. The peak flood depth is typically indicated to be below 0.6 m.

10.3.16 Climate change was not considered as part of the breach assessment. In the absence of such data the undefended modelled outputs may be utilised to provide a conservative estimate of the risk of flooding during such a scenario. The modelled output (Figure 6 of the Flood Risk and Drainage Assessment report - ES Appendix 10.1) for the 0.5% AEP undefended event plus climate change (2069 - 2051, 95P proxy) indicates widespread flooding of the surrounding area, with a maximum flood level of 6.69 m AOD at the Site.

10.3.17 However, a more accurate maximum flood level at the Site for the year 2051 may be estimated as 6.42 m AOD (70th Percentile; 70P) and 6.48 m AOD (95P); this is the modelled flood level at the Site during a present day 0.5% AEP breach event (6.22 m AOD) plus the calculated allowance for climate change to the year 2051 of 0.20 m and 0.26 m respectively (albeit such increases in sea level may not be expected to be fully realised at the Site).

10.3.18 It is concluded that the Site is at a Low risk of flooding from the River Wyre (tidal) as a result of overtopping; however, there is a residual risk of flooding from defence failure (breach). Given the aspirations to maintain defences within the locality, the risk of tidal flooding may be defined as Medium; however, the likelihood of the defences failing is assessed to be low.

10.3.19 A 1D-2D ISIS-TUFLOW hydraulic model of Hillylaid Pool and Royles Brook was developed as part of the Environment Agency Hillylaid Pool and Royles Brook Flood Risk Mapping Study (February 2012). This assesses the risk of flooding from Hillylaid Pool and Royles Brook for the present day 1% and 0.1% AEP events and the 1% AEP event +20% climate change.

10.3.20 The modelling study considered two scenarios: defended (pumping stations operating at 100% capacity) and undefended (pumping stations not operating and flapped outlets removed to allow tidal incursion).

10.3.21 The modelled outputs (Figure 7 of the Flood Risk and Drainage Assessment report - ES Appendix 10.1) for both scenarios indicate that no flooding of the Site or access would be expected in up to a 0.1% AEP event.

10.3.22 The current Environment Agency guidance on climate change allowances (May 2022) advises that the Central allowance should be used to assess flood risk for the lifetime of the development. The Central allowance for the Wyre management catchment is +23% (2050s). Recognising the flood extents from the aforementioned modelling study, this would not be expected to impact the Site during either the defended or undefended scenario.

10.3.23 There are a number of existing culverts along Royles Brook within the vicinity of the Site, including at the existing access crossing between the main site and the southern parcel. Blockage of these structures was not considered as part of the 2012 modelling study.

10.3.24 The topographic survey of the Site indicates that the existing access crossing is at a level of 5.7 - 6.4 m AOD, whilst existing ground levels on the main site and the southern parcel are indicated to be in the region of 5.3 - 5.9 m AOD. In the event of a blockage of this structure, there is the potential for floodwater to flow onto the Site if bank levels are exceeded.

10.3.25 However, given the presence of culverts upstream of the Site, and the industrial setting, the likelihood of the culvert adjacent to the Site becoming blocked is assessed to be relatively low.

10.3.26 The topographic survey of the Site and LiDAR data indicate that the Royles Brook channel is relatively deep (typically in excess of 3.0 m), so if a blockage of the culvert inlet did occur, it may be reasonable to assume that floodwaters would be contained in (or within close proximity to) the channel until such time as the blockage is cleared. If bank levels were exceeded, floodwater would not be expected to accumulate to any significant depth due to the dispersion of floodwater over a large area (ground levels across Hillhouse Enterprise Zone to the east and west of Royles Brook are relatively flat).

10.3.27 No modelled data has been provided by the Environment Agency for Springfield. The Flood Risk from Surface Water map has therefore been utilised to assess the risk of flooding from this source. This indicates that no flooding of the Site is expected from Springfield in up to a 0.1% AEP event.

10.3.28 It is concluded that the Site is at a Low risk of flooding from rivers (fluvial), albeit there may be a residual risk of flooding due to blockage of the inlet of the existing Royles Brook access crossing culvert adjacent to the Site.

Flood Risk from Small Watercourses and Surface Water (Pluvial)

10.3.29 There are no small watercourses located within the vicinity of the Site.

10.3.30 The Flood Risk from Surface Water map indicates that the Site is predominately at a Very Low risk of pluvial flooding from surface water; however, there are three isolated areas of Low risk in the north-west of the main site and one in the south-east of the southern parcel, which represent localised depressions in the topography. The maximum flood depth and velocity at these locations is indicated to be below 0.3 m (with depths of up to 0.6 m on the southern parcel) and 0.25 m/s respectively.

10.3.31 However, the Flood Risk from Surface Water map is indicative and does not differentiate between multiple sources of flood risk. In this instance the local drainage systems are unlikely to be accurately represented due to assumptions made regarding their capacity. For example, the Risk of Flooding from Surface Water modelling methodology assumes that surface water drainage systems provide a 12 mm/hr (33.3 l/s per ha) surface water removal rate in urban areas. This is likely to be a significant underestimation.

10.3.32 It is concluded that the Site is not at risk of flooding from small watercourses and is at a Very Low risk of pluvial surface water flooding.

Flood Risk from Reservoirs, Canals and Other Water Impounding Structures

10.3.33 There are no canals or other impounded waterbodies located within the immediate vicinity of the Site. The Flood Risk from Reservoirs map indicates that the Site is not at risk of flooding from such sources.

10.3.34 It is concluded that the Site is not at risk of flooding from reservoirs, canals or other water impounding structures.

Flood Risk from Groundwater

10.3.35 Figure 9.3 of the 2016 Level 1 Strategic Flood Risk Assessment ("Groundwater Flooding") indicates that the Site is located within an area with a >= 50% <70% susceptibility to groundwater flooding. However, it is acknowledged that this mapping is relatively broad scale.

10.3.36 The JBA Groundwater Flood Risk Indicator map indicates that the Site is at a Negligible risk during a 1% AEP groundwater flood event.

10.3.37 It is concluded that the Site is at a Low risk of flooding from groundwater.

Land Drainage

10.3.38 An indicative existing surface water drainage record drawing for the main site shows several outfalls to Royles Brook, two from the north-east and five from the south-west:

- North-East - The topographic survey identifies a 600 mm diameter piped north-western outfall to Royles Brook; however, the south-east outfall is located in an area of dense shrub which was unable to be surveyed.
- South-West - Within the southern parcel, the topographic survey identifies a channel drain, several manholes and a 680 mm diameter piped outfall to Royles Brook located adjacent to the watercourse crossing. No other outfalls are identified as these are located outside of the southern parcel area.

10.3.39 According to the Soilscapes soils dataset produced by the Cranfield Soil and AgriFood Institute, soil conditions at the Site and within the surrounding area are described as loamy and clayey soils of coastal flats with naturally high groundwater.

10.3.40 British Geological Survey mapping of surface geology indicates the underlying bedrock formation comprises Preesall Halite Member - Mudstone and Halite-Stone, with an area of Kirkham Mudstone Member - Mudstone in the south, overlain by Tidal Flat Deposits, 1 - Clay and Silt superficial deposits.

10.3.41 According to the MAGIC website the Kirkham Mudstone Member bedrock at the Site is classified as a Secondary B aquifer, whilst the superficial deposits and Preesall Halite Member bedrock are classified as unproductive. The Site is not shown to be located within a designated groundwater source protection zone.

Infrastructure - Wastewater Treatment and Sewerage

10.3.42 United Utilities public sewer records indicate that there are no public sewers located in the vicinity of the Site. No details of a private network are currently available.

Development Receptors

10.3.43 Table 10.5 lists the identified environmental receptors and their assessed importance / scale using the criteria presented in Table 10.2 as guidance.

Table 10.5 – Development Receptors

Impact	Receptor	Nature of Effect	Importance of Receptor
Surface water *Water quality*	River Wyre	Pollution risk	High
	Royles Brook	Pollution risk	Medium
	Hillylaid Pool	Pollution risk	Medium
	Springfield	Pollution risk	Medium
Flood risk management *Inc. land drainage*	River Wyre	Flood risk	High
	Royles Brook	Flood risk	Medium
	Hillylaid Pool	Flood risk	Medium
	Springfield	Flood risk	Medium
	Site workers and local residents (Construction phase)	Flood risk	High
	Site employees, visitors and local residents (Operational phase)	Flood risk	High
Infrastructure *Wastewater treatment and sewerage*	Sewerage infrastructure	Service continuity; increase in loading	Medium

Future Baseline

10.3.44 The existing flood risk to the Site and surrounding area from all identified sources, and the quality of the receiving surface water bodies will remain as existing in the future, or potentially improve or deteriorate.

10.3.45 Any committed or pending developments within the vicinity of the Site, which have been considered in the cumulative effects section of this Chapter, could affect the future baseline for surface water drainage and flood risk and this is therefore considered below.

10.3.46 In accordance with the NPPF and the supporting PPG, a site-specific Flood Risk Assessment and / or Drainage Assessment should be undertaken in support of a planning application. This should include appropriate flood risk mitigation measures and an outline surface water drainage strategy demonstrating how runoff will be managed so as not to increase flood risk elsewhere over the lifetime of the development (i.e. taking climate change into account), with betterment provided where possible. Appropriate mitigation should also be incorporated into the construction and operational phases of the committed schemes to ensure that surface water runoff is not contaminated and adversely affected.

10.3.47 Prior to the construction of all approved schemes, details of the mitigation measures addressing the above would need to be approved in writing by the local planning authority.

10.3.48 Recognising the above, the schemes would be expected to have a Negligible effect on surface water, flood risk, land drainage and infrastructure (wastewater treatment and sewerage) even if all developments are operational. In turn this would be expected to have a Negligible effect on the future baseline scenario.

10.4 Assessment of Effects

10.4.1 This section summarises the embedded mitigation and the likely effects of the Proposed Development during the construction, operational and decommissioning phases.

Embedded Mitigation

10.4.2 The risk of flooding to the Proposed Development from all identified sources is assessed to be low, albeit there is a residual risk of flooding from failure (breach) of the River Wyre tidal defences and due to blockage of the inlet of the existing access crossing culvert on Royles Brook adjacent to the Site.

10.4.3 The risk of flooding to the Proposed Development will be mitigated through the implementation of the following measures, in accordance with Policy SA4 of the Wyre Local Plan (January 2023):

i) IBA and IBAA stockpiles shed to be located on a concrete slab set at a level of 6.50 m AOD. This is 20 mm above the estimated flood level of 6.48 m AOD expected at the Site in a 0.5% breach event plus climate change (2051, 95P).
ii) IBA processing plant building to be located on a concrete slab set at a level of 5.72 - 6.56 m AOD, with the plant all on steel framework above 6.50 m AOD.
iii) Finished floor level of all proposed offices to be set at a minimum level of 6.48 m AOD.
iv) Where practicable, the finished floor level of all new buildings to be at least 0.15 m above adjacent ground levels following any reprofiling of the Site, with ground levels sloping down from the buildings.
v) A retaining wall to be constructed around the main site (excluding the main site entrance area) to prevent the escape of contaminated water. This will be 3.0 m high adjacent to Royles Brook and in the form of raised upstand/kerb along the northern boundary at a level of 6.80 m AOD.
vi) A retaining wall to be constructed around the southern parcel (at a minimum level of 6.50 m AOD), which will mitigate the residual risk of flooding from failure (breach) of the River Wyre tidal defences and prevent the escape of contaminated water from the site.
vii) An open space buffer to be provided adjacent to Royles Brook to protect the watercourse from detrimental impacts and allow for future access for maintenance.

10.4.4 Given the processes to be used on site, Fortis IBA Ltd intend to capture surface water runoff and store within on site tanks for later use as part of a rainwater harvesting system. Any overflow runoff, and runoff from the car park/office area (i.e. the main site entrance), will be directed to Royles Brook as the Site is underlain by soils with impeded drainage. Therefore, the disposal of surface water via infiltration is unlikely to be feasible and is not considered practicable.

10.4.5 An outline surface water drainage strategy is presented in Section 5 of the Flood Risk and Drainage Assessment report (ES Appendix 10.1). The design principles of the strategy comprise the following:

i) The total flow from the redeveloped site will discharge at restricted rates to suit a 30% betterment of the 1 in 1 AEP brownfield rate of 224.2 l/s, equating to a total flow rate of 156.9 l/s.

ii) Surface water runoff from the car park/office area to be restricted to the existing greenfield QBAR rate of 2.5 l/s/ha so far as is practicable; however, it is recognised that a flow control with a diameter of less than 75 mm may pose a risk of blockage to the drainage system. As such, it is proposed to utilise a discharge rate of 3.5 l/s to suit a 75 mm control opening.

iii) Surface water runoff from the metal bays, stockpile shed and plant roofs to discharge to above ground storage tanks. These tanks will act as long term storage for later use and also provide attenuation storage when the required long term capacity has been reached. On a pro-rata basis based on contributing areas, an overflow to each tank will discharge at restricted rates totalling 153.4 l/s.

iv) Surface water runoff from the external hardstanding area of the southern parcel will discharge into a catchpit prior to being pumped to an above ground storage tank. No overflow for discharge to Royles Brook is proposed as this water will be potentially contaminated. This water will be disposed of by pumping to the IBA and IBAA storage building where it will be sprayed onto material heaps, ensuring that the tank remains empty.

v) Attenuation storage for the car park/office area, metal bays, stockpile shed and plant roof, and the southern parcel external area sized to store the 1 in 100 AEP rainfall event including a 25% increase in rainfall intensity to allow for climate change in accordance with the design life and Environment Agency guidance.

vi) A SPEL Puraceptor (or similar) bypass retention separator to be incorporated within the car park area where discharge will be continuous.

vii) Catchpit manholes to be utilised to help ensure debris does not discharge into the downstream receptor.

10.4.6 It is understood that there will be no piped discharge of runoff to Royles Brook for the majority of rainfall events due to the volume of water needed for the processes on site.

10.4.7 A preliminary drainage layout is provided in Appendix H of the Flood Risk and Drainage Assessment report (ES Appendix 10.1).

10.4.8 Foul water from the offices and weighbridge area will be treated on the Site and discharged to Royles Brook. Foul water from the plant area will also be treated on the Site, including UV filtering, and discharged into the surface water drainage system and stored in the above ground tanks for later use. It is anticipated that below ground private package treatment plants will be utilised.

Construction Phase

Surface Water

10.4.9 During the construction phase there will be a number of activities which could potentially reduce surface water quality. These include:

i) Materials handling, storage, stockpiling, spillage and disposal;
ii) Earthworks involving manipulation of ground levels and re-engineering of existing made ground if/as necessary;
iii) Excavation and foundation construction within the Site and site preparation;
iv) Installation of temporary and permanent infrastructure and roads;
v) Installation of temporary site accommodation and sanitary facilities;
vi) Construction of proposed buildings;
vii) Construction of surface water sewers;
viii) Construction / installation of surface water attenuation features;
ix) Formation of landscaping; and
x) Movement and use of static and mobile plant/construction vehicles.

10.4.10 Construction activities may lead to the disturbance and mobilisation of physical contaminants (i.e. dust, sediments and muds). During periods of heavy rainfall, vehicle movements resulting in damage to soil structure may generate increased sedimentation within surface water runoff. In addition, during periods of dry, windy weather, wind-blown dusts may be generated by the excavation of soils.

10.4.11 These activities may result in sediments directly or indirectly entering surface water features, thereby affecting the physical, chemical and biological quality of the surface water receptors in the surrounding area.

10.4.12 Contaminants, spilled contaminants and suspended sediments have the potential to affect surface water bodies via surface runoff.

10.4.13 Construction activities such as ground excavation or piling may create new pollutant pathways from the surface to the underlying aquifer.

Flood Risk Management and Land Drainage

10.4.14 The Site is not at risk of flooding from the River Wyre or fluvial sources during the present day. As such, the construction phase would not affect flood risk management; however, there is a residual risk of flooding from failure (breach) of the River Wyre tidal defences and due to blockage of the inlet of the existing access crossing culvert on Royles Brook adjacent to the Site

10.4.15 Potential ponding of surface water and accidental runoff to the surrounding area may occur whilst the surface water drainage system is being constructed.

10.4.16 Soil compaction on Site may also increase on and off-site flood risk.

Infrastructure - Wastewater Treatment and Sewerage

10.4.17 As detailed in para. 10.4.8, foul water from the offices and weighbridge area will be treated on the Site and discharged to Royles Brook via an existing outfall. Foul water from the plant area will also be treated on the Site and discharged into the surface water drainage system and stored in the above ground tanks for later use.

10.4.18 As such, the construction phase would not affect existing sewage infrastructure.

Summary

10.4.19 The likely effects of the Proposed Development during the construction phase following implementation of the embedded mitigation but prior to the application of any additional mitigation measures are summarised in Table 10.6.

Table 10.6 – Potential Effect During Construction Phase (Pre-Mitigation)

Impact	Receptor	Nature of Effect	Importance of Receptor	Magnitude of Change	Significance of Effect
Surface water *Water quality*	River Wyre	Pollution risk	High	Minor	Minor Adverse, Not Significant
	Royles Brook	Pollution risk	Medium	Minor	Negligible, Not Significant
	Hillylaid Pool	Pollution risk	Medium	Minor	Negligible, Not Significant
	Springfield	Pollution risk	Medium	Negligible	Negligible, Not Significant
Flood risk management *Inc. land drainage*	River Wyre	Flood risk	High	Negligible	Negligible, Not Significant
	Royles Brook	Flood risk	Medium	Minor	Negligible, Not Significant
	Hillylaid Pool	Flood risk	Medium	Minor	Negligible, Not Significant
	Springfield	Flood risk	Medium	Negligible	Negligible, Not Significant
	Site workers and local residents	Flood risk	High	Minor	Minor Adverse, Not Significant
Infrastructure *Wastewater treatment and sewerage*	Sewerage infrastructure	Connections	Medium	Negligible	Negligible, Not Significant

Operational Phase

Surface Water

10.4.20 The increase in impermeable area and traffic arising from the Proposed Development could potentially increase the risk of contamination of surface runoff due to spillage of contaminants and from flushing of pollutants from the impermeable surfaces. Contaminated surface runoff could enter local surface water bodies.

Flood Risk Management and Land Drainage

10.4.21 Any development or raising of ground levels within areas considered to be at risk of flooding has the potential to increase flood risk to people, property and elsewhere in the local catchment by displacing floodwaters and flood storage during times of flooding.

10.4.22 If unattenuated, the increase in the extent of impermeable area at the Site would increase the rate of surface water runoff and total runoff volumes to the surrounding area and in turn the level of flood risk.

Infrastructure - Wastewater Treatment and Sewerage

10.4.23 As foul water will be treated on the Site and discharged to either Royles Brook or into the surface water drainage system, the operational phase would not affect existing sewage infrastructure.

Summary

10.4.24 The likely effects of the Proposed Development during the operational phase following implementation of the embedded mitigation but prior to the application of any additional mitigation measures are summarised in Table 10.7.

Table 10.7 – Potential Effect During Operational Phase (Pre-Mitigation)

Impact	Receptor	Nature of Effect	Importance of Receptor	Magnitude of Change	Significance of Effect
Surface water *Water quality*	River Wyre	Pollution risk	High	Negligible	Negligible, Not Significant
	Royles Brook	Pollution risk	Medium	Moderate	Minor Beneficial, Not Significant
	Hillylaid Pool	Pollution risk	Medium	Moderate	Minor Beneficial, Not Significant
	Springfield	Pollution risk	Medium	Negligible	Negligible, Not Significant
Flood risk management *Inc. land drainage*	River Wyre	Flood risk	High	Negligible	Negligible, Not Significant
	Royles Brook	Flood risk	Medium	Moderate	Minor Beneficial, Not Significant
	Hillylaid Pool	Flood risk	Medium	Moderate	Minor Beneficial, Not Significant
	Springfield	Flood risk	Medium	Negligible	Negligible, Not Significant
	Site employees, visitors and local residents	Flood risk	High	Minor	Minor Adverse, Not Significant
Infrastructure *Wastewater treatment and sewerage*	Sewerage infrastructure	Capacity	Medium	Negligible	Negligible, Not Significant

Decommissioning Phase

Surface Water

10.4.25 During the decommissioning phase there will be a number of activities which could reduce surface water quality. These will be similar to those outlined in the construction phase section detailed in para. 10.4.9 to 10.4.13.

Flood Risk Management and Land Drainage

10.4.26 There is the potential for surface water runoff and an increase in on and off-site flood risk during the decommissioning of the surface water drainage system.

10.4.27 Soil compaction at the Site may also increase on and off-site flood risk.

Infrastructure - Wastewater Treatment and Sewerage

10.4.28 The private sewage infrastructure could be affected during the disconnections from the Site; however, the impact would be a short-term reduction and delay in disposal services.

Summary

10.4.29 The likely effects of the Proposed Development during the decommissioning phase following implementation of the embedded mitigation but prior to the application of any additional mitigation measures are summarised in Table 10.8.

Table 10.8 – Potential Effect During Decommissioning Phase (Pre-Mitigation)

Impact	Receptor	Nature of Effect	Importance of Receptor	Magnitude of Change	Significance of Effect
Surface water *Water quality*	River Wyre	Pollution risk	High	Minor	Minor Adverse, Not Significant
	Royles Brook	Pollution risk	Medium	Minor	Negligible, Not Significant
	Hillylaid Pool	Pollution risk	Medium	Minor	Negligible, Not Significant
	Springfield	Pollution risk	Medium	Negligible	Negligible, Not Significant
Flood risk management *Inc. land drainage*	River Wyre	Flood risk	High	Negligible	Negligible, Not Significant
	Royles Brook	Flood risk	Medium	Minor	Negligible, Not Significant
	Hillylaid Pool	Flood risk	Medium	Minor	Negligible, Not Significant
	Springfield	Flood risk	Medium	Negligible	Negligible, Not Significant
	Site workers and local residents	Flood risk	High	Minor	Minor Adverse, Not Significant
Infrastructure *Wastewater treatment and sewerage*	Sewerage infrastructure	Connections	Medium	Negligible	Negligible, Not Significant

10.5 Cumulative Effects

10.5.1 As detailed in paragraph 10.3.47 - 10.3.48, in accordance with the NPPF and the supporting PPG the planning application for any committed or pending developments within the vicinity of the Site should be accompanied by a site-specific Flood Risk Assessment and / or Drainage Assessment, including appropriate flood risk mitigation measures and an outline surface water drainage strategy.

10.5.2 Details of the mitigation measures would subsequently need to be approved in writing by the local planning authority (or other relevant body) prior to the construction of all approved schemes.

10.5.3 Recognising the above, the schemes would be expected to have a Negligible effect on surface water, flood risk, land drainage and infrastructure (wastewater treatment and sewerage) even if all developments are operational. In turn, this would be expected to have a Negligible effect on the Proposed Development.

10.6 Mitigation

Construction Mitigation

10.6.1 Potential effects on the water environment through the construction phase would be managed by a range of operational, control and monitoring measures that would act to mitigate the potential effects on surface water, flood risk, land drainage and infrastructure (wastewater treatment and sewerage).

10.6.2 As a matter of course the following would occur; note the principal contractor may use alternative procedures compliant with their own environmental management system. However, the broad approach and content would as a minimum be comparable to the following:

i) A Construction Environmental Management Plan (CEMP) or equivalent would be prepared, submitted by the principal contractor and agreed with the local planning authority. The CEMP will set out the methods, including the minimum requirements as agreed between the construction contractor and the local planning authority, by which construction will be managed to avoid, minimise and mitigate any adverse effects on the water environment. The CEMP should cover: Site security; Fuel oil storage, bunding, delivery and use; How both minor and major spillage will be dealt with; Containment of silt/soil contaminated runoff; Disposal of contaminated drainage, including water pumped from excavations; and Site induction for workforce highlighting pollution prevention and awareness;

ii) All construction works would be designed in accordance with the latest relevant guidelines;

iii) Contractors undertaking earthworks would develop risk assessments and method statements covering all aspects of their work that have the potential to cause physical damage to structures (e.g. sewerage infrastructure), mobilise large quantities of soil/sediments or block open watercourses. Earth moving operations would be undertaken in accordance with BS 6031: 2009 Code of Practice for Earthworks. These would be incorporated within the CEMP;

iv) Works affecting soils would follow good practice guides for handling soils which would provide guidance on the use, management and movement of soil on Site;

v) Good practice guidance on erosion and pollution control would be followed, e.g. CIRIA Environmental Good Practice on Site (C650) and Control of Water Pollution from Construction Sites (C532);

vi) The principal contractor would avoid the storage of plant, machinery fuel or materials (including soil stockpiles) alongside watercourses unless unavoidable. Construction works should be programmed as far as is practicable to minimise soil handling and temporary soil storage; and

vii) The refuelling of plant, storage of fuels and chemicals and overnight storage of mobile plant would be within the designated contractor's compound areas. The compounds would contain appropriate facilities for the storage of fuels and chemicals i.e. bunded and locked storage containers, and would also be equipped with spill kits.

10.6.3 The adoption of best practice construction methods and construction management processes would significantly mitigate many of the identified potential environmental effects of the construction phase of the Proposed Development.

10.6.4 The principal contractor and / or site manager to sign up to receive flood warnings from the Environment Agency via its Floodline service - https://www.gov.uk/sign-up-for-flood-warnings or 0345 988 1188.

10.6.5 The Site should be evacuated if a Flood Warning is received from the Environment Agency (issued when flooding of homes and businesses, rail infrastructure and roads is forecast).

10.6.6 Royles Brook and the associated culvert at the existing access crossing between the main site and the southern parcel to be regularly checked to ensure that this remains free of debris and to minimise the risk of blockage.

10.6.7 Prior to undertaking any permanent and / or temporary works to or within 8 m of the landward toe of the Royles Brook flood defence an Environmental Permit for Flood Risk Activities would be obtained from the Environment Agency.

10.6.8 Surface water runoff during the construction phase will be carefully controlled with temporary drainage, including pollution prevention control.

10.6.9 Foul water from temporary staff welfare facilities would be contained within sealed storage vessels and disposed of off-site to minimise the risk of surface water contamination. Welfare facilities would only be used for the disposal of domestic wastewater.

Operational Mitigation

10.6.10 The Royles Brook culvert at the existing access crossing between the main site and the southern parcel to be regularly checked to ensure that this remains free of debris and to minimise the risk of blockage.

10.6.11 A Flood Warning and Evacuation Plan will be prepared in consultation with Wyre Council and Lancashire County Council emergency planning team. The Site is located within an Environment Agency flood alert and warning area. This should provide the opportunity for the relevant response procedures set out in the plan to be invoked in response to receipt of a flood warning from the Environment Agency

10.6.12 No further mitigation, enhancement or compensation, over and above the incorporated mitigation detailed in para. 10.4.3 and 10.4.8 is deemed to be necessary for the operational phase.

Decommissioning Mitigation

10.6.13 Potential effects on the water environment through the decommissioning phase would be managed by similar measures implemented during the construction phase as detailed in para. 10.6.1 to **Error! Reference source not found.**.

10.6.14 The surface water drainage system would be decommissioned from the head of the system towards the outfall to ensure the surface water drainage system continues to operate until all impermeable areas have been replaced with permeable surfaces.

10.7 Residual Effects and Conclusions

10.7.1 The magnitude of change during the construction and operational phases following the application of the embedded mitigation and identified mitigation measures (i.e., the residual effect) has been assessed with reference to the extent, magnitude and duration of the effect; performance against environmental quality standards and other relevant criteria; receptor sensitivity and compatibility with environmental policies.

Construction Phase

10.7.2 The potential effects on the water environment during the construction phase of the Proposed Development will be managed through a range of control and monitoring measures that would act to mitigate the potential effects on surface water, flood risk management, land drainage and infrastructure (wastewater treatment and sewerage).

10.7.3 The adoption of best practice construction methods and construction management processes will mitigate the potential environmental effects of the construction phase of the Proposed Development and therefore the Proposed Development will have a Negligible, Not Significant residual effect on the water environment.

10.7.4 Table 10.9 provides a summary of the significance of effects resulting from the Proposed Development following implementation of the mitigation measures identified in this Chapter.

Table 10.9 – Residual Effects During Construction Phase (Post-Mitigation)

Impact	Receptor	Nature of Effect	Importance of Receptor	Significance of Effect; Pre-Mitigation	Mitigation	Residual Significance of Effect
Surface water *Water quality*	River Wyre	Pollution risk	High	Minor Adverse, Not Significant	Operational, control and monitoring measures including a CEMP. Sign up to receive flood warnings from the Environment Agency.	Negligible, Not Significant
	Royles Brook	Pollution risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Hillylaid Pool	Pollution risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Springfield	Pollution risk	Medium	Negligible, Not Significant		Negligible, Not Significant

Flood risk management *Inc. land drainage*	River Wyre	Flood risk	High	Negligible, Not Significant	Royles Brook and associated culvert adjacent to the Site to be regularly checked to ensure that this remains free of debris.	Negligible, Not Significant
	Royles Brook	Flood risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Hillylaid Pool	Flood risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Springfield	Flood risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Site workers and local residents	Flood risk	High	Minor Adverse, Not Significant		Negligible, Not Significant
Infrastructure *Wastewater treatment and sewerage*	Sewerage infrastructure	Connections	Medium	Negligible, Not Significant		Negligible, Not Significant

Operational Phase

10.7.5 The implementation of the flood risk mitigation measures and an appropriately designed surface water drainage scheme, including the storage and controlled release of surface water at a peak rate that is significantly less than existing will provide betterment in respect of flood risk.

10.7.6 The Proposed Development therefore has the potential to have a Minor Beneficial effect on surface water and flood risk management in respect of the local area (specifically Royles Brook and Hillylaid Pool), with a Negligible, Not Significant residual effect on the water environment.

10.7.7 Table 10.10 provides a summary of the significance of effects resulting from the Proposed Development following implementation of the mitigation measures identified in this Chapter.

Table 10.10 – Residual Effects During Operational Phase (Post-Mitigation)

Impact	Receptor	Nature of Effect	Importance of Receptor	Significance of Effect; Pre-Mitigation	Mitigation	Residual Significance of Effect
Surface water *Water quality*	River Wyre	Pollution risk	High	Negligible, Not Significant	Flood warning and evacuation plan. Royles Brook and associated	Negligible, Not Significant
	Royles Brook	Pollution risk	Medium	Minor Beneficial, Not Significant		Minor Beneficial, Not Significant

	Hillylaid Pool	Pollution risk	Medium	Minor Beneficial, Not Significant	culvert adjacent to the Site to be regularly checked to ensure that this remains free of debris.	Minor Beneficial, Not Significant
	Springfield	Pollution risk	Medium	Negligible, Not Significant		Negligible, Not Significant
Flood risk management *Inc. land drainage*	River Wyre	Flood risk	High	Negligible, Not Significant	No further mitigation over and above the embedded mitigation (inc. a surface water drainage strategy and the use of SuDS, raising finished floor levels and a package treatment plant) is deemed to be necessary.	Negligible, Not Significant
	Royles Brook	Flood risk	Medium	Minor Beneficial, Not Significant		Minor Beneficial, Not Significant
	Hillylaid Pool	Flood risk	Medium	Minor Beneficial, Not Significant		Minor Beneficial, Not Significant
	Springfield	Flood risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Site employees, visitors and local residents	Flood risk	High	Minor Adverse, Not Significant		Negligible, Not Significant
Infrastructure *Wastewater treatment and sewerage*	Sewerage infrastructure	Capacity	Medium	Negligible, Not Significant		Negligible, Not Significant

Decommissioning Phase

10.7.8 The potential effects on the water environment during the construction phase of the Proposed Development will be managed through a range of control and monitoring measures that would act to mitigate the potential effects on surface water, flood risk management, land drainage and infrastructure (wastewater treatment and sewerage).

10.7.9 The adoption of best practice construction methods and construction management processes including the decommissioning of the surface water drainage system would mitigate the potential environmental effects of the decommissioning phase of the Proposed Development and therefore the Proposed Development would have a Negligible, Not Significant residual effect on the water environment.

10.7.10 Table 10.11 provides a summary of the significance of effects resulting from the Proposed Development following implementation of the mitigation measures identified in this Chapter.

Table 10.11 – Residual Effects During Decommissioning Phase (Post-Mitigation)

Impact	Receptor	Nature of Effect	Importance of Receptor	Significance of Effect; Pre-Mitigation	Mitigation	Residual Significance of Effect
Surface water *Water quality*	River Wyre	Pollution risk	High	Minor Adverse, Not Significant	Operational, control and monitoring measures including a CEMP; best practice methods including decommissioning of surface water drainage system. Sign up to receive flood warnings from the Environment Agency. Royles Brook and associated culvert adjacent to the Site to be regularly checked to ensure that this remains free of debris.	Negligible, Not Significant
	Royles Brook	Pollution risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Hillylaid Pool	Pollution risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Springfield	Pollution risk	Medium	Negligible, Not Significant		Negligible, Not Significant
Flood risk management *Inc. land drainage*	River Wyre	Flood risk	High	Negligible, Not Significant		Negligible, Not Significant
	Royles Brook	Flood risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Hillylaid Pool	Flood risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Springfield	Flood risk	Medium	Negligible, Not Significant		Negligible, Not Significant
	Site workers and local residents	Flood risk	High	Minor Adverse, Not Significant		Negligible, Not Significant
Infrastructure *Wastewater treatment and sewerage*	Sewerage infrastructure	Connections	Medium	Negligible, Not Significant		Negligible, Not Significant

Appendix 10.1 – Flood Risk and Drainage Assessment, July 2024

Hillhouse IBA Facility

Environmental Statement Chapter 11.0
Summary of Effects

Prepared for

Fortis IBA Limited

July 2024
3566-01-ES11

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11.0 SUMMARY OF EFFECTS

11.1 Residual Effects

11.1.1 ES Chapters 5.0 – 10.0 (topic chapters) have considered the potential environmental impacts of the Proposed Development in order to determine whether or not they give rise to likely significant effects, and then identified the mitigation required to reduce these effects where necessary. This chapter summarises those likely environmental effects of the Proposed Development that have been identified, following implementation of embedded mitigation (mitigation as part of the baseline design) or additional mitigation (further mitigation measures required specifically to reduce impacts in this instance) (as introduced in ES Chapter 2.0 [EIA Methodology] and described in further detail in ES Chapters 5.0 – 10.0 [topic chapters]).

11.1.2 This chapter also summarises monitoring and/or enhancement measures (where relevant), and the consequential residual effects, following their assumed implementation.

11.1.3 The above information is provided in Table 11.1 below.

11.1.4 Schedule 4 of the EIA Regulations requires a description of the likely significant effects of a development. This description should cover the direct effects, and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. To provide further clarification on the nature of the effects, each has been identified in a tabular format and classified for the purposes of this summary as:

i) Short term (St) – effects occurring only over a short period of time. As the Proposed Development is designed (and assessed) to be permanent, medium-term effects (occurring for the duration of the Proposed Development's operation) and long-term effects (occurring beyond the operation of the Proposed Development) are deemed to be covered under 'permanent' effects (see below).

ii) Temporary (T) – effects that are not permanent because the effect would no longer occur if the impact was removed.

iii) Permanent (P) – effects that remain and cannot be readily reversed up to and beyond the cessation of the operation of the Proposed Development.

iv) Direct (D) – effects that result as a consequence of a direct impact.

v) Indirect (In) – also known as secondary effects, effects that result indirectly, but that are inevitably caused as a result of the Proposed Development.

Table 11.1 Summary of Likely Residual Effects

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
Chapter 5.0 Traffic and Transport					
Construction	Construction traffic	Not Significant	Measures to manage any potential adverse traffic effects would be detailed in a Construction Traffic Management Plan.	Not Significant	St, T, D
Operation	Assessment of the Proposal against 2026 Year of Opening	Negligible to Minor, Not Significant	None proposed.	Negligible to Minor, Not Significant	D, P
	Assessment of the Proposal against the 2031 Future Design Year				
	Driver Delay				
	Severance				
	Non-Motorised User Amenity (including Fear and Intimidation)				
	Decommissioning Night-time Effects (including lighting)				
Chapter 6.0 Ecology					
Construction and Decommissioning	Statutory Designated Sites	Negligible to Minor Adverse, Not Significant	Implementation of CEMP and appointment of Ecological Clerk of Works, Avoidance and Protection Measures detailed within Chapter 6.0.	Negligible to Minor Adverse, Not Significant	St, T, D
	Non Statutory Sites	Negligible to Minor, Not Significant		Negligible, Not Significant	
	Priority Habitats	Negligible, Not Significant		Negligible, Not Significant	
	Dust/emissions	Minor adverse, Not Significant		Negligible, Not Significant	

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
Operation	Statutory Designated Sites	Negligible to Minor Adverse, Not Significant	None proposed.	Negligible, Not Significant	D, P
	Non Statutory Sites	No impacts anticipated, Not Significant		Not Significant	
Chapter 7.0 Noise					
Construction	Effect of Vibration on Residential Receptors	Neutral, Not Significant	`Best practical means' (BPM) would be applied in accordance with BS5228-1:2009+A1:2014 to reduce and minimise impact during construction.	Neutral, Not Significant	St, T, D
	Effect of Vibration of Ecological Receptors	Neutral to Moderate, Not Significant		Neutral, Not Significant	
	Road Traffic Noise – All receptors	Minor, Not Significant	None proposed.	Neutral to Minor, Not Significant	
	Effect of Construction Noise on Residential Receptors	Neutral to Minor, Not Significant	BPM would be applied in accordance with BS5228-1:2009+A1:2014 to reduce and minimise impact during construction.	Neutral, Not Significant	
	Effect of Construction Noise on Ecological Receptors	Minor to Moderate, Not Significant	Avoid events such as percussive piling during the sensitive period for ecological receptors. BPM would be applied in accordance with BS5228-	Slight to Minor, Not Significant	

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
			1:2009+A1:2014 to reduce and minimise impact during construction.		
Operation	Effect of Operational Noise on Residential Receptors	Moderate, Not Significant	Numerous additional measures, including treatment of specific aspects of the buildings with acoustic cladding to the levels specified in Chapter 7.0.	Neutral, Not Significant	P, D
	Effect of Operational Noise on Ecological Receptors	Moderate, Not Significant		Minor, Not Significant	
	Operational Road Traffic Noise	Neutral to Minor, Not Significant	None proposed.	Neutral to Minor, Not Significant	
	Operational Vibration	Neutral, Not Significant	None proposed.	Neutral, Not Significant	
Decommissioning	Decommissioning Noise and Vibration on Residential Receptors	Neutral to Minor, Not Significant	BPM would be applied in accordance with BS5228-1:2009+A1:2014 to reduce and minimise impact during decommissioning. Measures controlled through a DEMP to limit effects.	Neutral to Minor, Not Significant	St, T, D
	Decommissioning Noise and Vibration on Ecological Receptors	Minor to Moderate, Not Significant	BPM would be applied in accordance with BS5228-1:2009+A1:2014 to reduce and minimise impact during decommissioning.	Neutral to Minor, Not Significant	

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
			Measures controlled through a DEMP to limit effects.		
Chapter 8.0 Air Quality					
Construction	Construction Dust	Not Significant	None proposed above BPM detailed within a CEMP.	Not Significant.	St, T, D
	Exhaust pollutants from Construction Phase Traffic	Negligible, Not Significant	None proposed above BPM detailed within a CEMP.		
Operation	Operational Phase Dust	Negligible, Not Significant	None proposed. Dust Management Plan (DMP) would be in place.		P, D
	Operational Phase Vehicle Emissions (Human Health)	Negligible, Not Significant	None proposed.		
	Operational Phase Vehicle Emissions (Ecology)	*(Screened out as Insignificant within Chapter 8.0, assessment presented at ES Appendix 8.4)*			
Decommissioning	Decommissioning and Demolition Dust	Not Significant	None proposed.	Not Significant.	St, T, D
	Exhaust pollutants from Decommissioning Phase Traffic	Negligible, Not Significant	None proposed above BPM detailed within a CEMP.		
Chapter 9.0 Ground Conditions					
Construction and Decommissioning	Human Health	Minor, Not Significant	Site investigation and quantitative risk assessment. Modular Compound Facilities and a CEMP/DEMP.	Negligible, Not Significant	St, T, D

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
	Controlled Waters (Including Ecology and Ecosystems)	Minor, Not Significant	Site investigation and quantitative risk assessment (Construction only). Piling Risk Assessment and associated mitigation (Construction only). BPM detailed within a CEMP/DEMP.	Minor, Not Significant	
	Property	Negligible, Not Significant	Site investigation and quantitative risk assessment (Construction only). Piling Risk Assessment and associated mitigation (Construction only).	Negligible, Not Significant	
Operation	Human Health	Minor, Not Significant	None	Negligible, Not Significant	P, D
	Controlled Waters (Including Controlled Waters)	Negligible to Minor, Not Significant			
	Property	Negligible, Not Significant			
Chapter 10.0 Flood Risk and Drainage					
Construction and Decommissioning	Surface Water Quality	Negligible to Minor Adverse, Not Significant	Sign up to receive flood warnings from the Environment Agency.	Negligible, Not Significant	St, T, D
	Flood Risk Management	Negligible to Minor Adverse, Not Significant			

<table>
<tr><th>Development Stage</th><th>Environmental Effect (following development design and impact avoidance measures)</th><th>Level of Effect (following development design and impact avoidance measures)</th><th>Further Mitigation, Monitoring and/or Enhancement</th><th>Level of Effect (following further mitigation, monitoring and/or enhancement)</th><th>Nature of Effect</th></tr>
<tr><td></td><td>Infrastructure</td><td>Negligible, Not Significant</td><td>Flood Warning and Evacuation Plan to be in place.

Checks of Royles Brook Culvert to ensure it remains free of debris.

CEMP and BPM.</td><td></td><td></td></tr>
<tr><td rowspan="3">Operation</td><td>Surface Water Quality</td><td>Negligible to Minor Beneficial, Not Significant</td><td rowspan="3">Sign up to receive flood warnings from the Environment Agency.

Flood Warning and Evacuation Plan to be in place.

Checks of Royles Brook Culvert to ensure it remains free of debris.</td><td>Negligible to Minor Beneficial, Not Significant</td><td rowspan="3">P, D</td></tr>
<tr><td>Flood Risk Management</td><td>Negligible to Minor Beneficial / Minor Adverse (Minor Adverse to Site employees, visitors and local residents), Not Significant</td><td>Negligible to Minor Beneficial (Negligible effect to Site employees, visitors and local residents), Not Significant</td></tr>
<tr><td>Infrastructure</td><td>Negligible, Not Significant</td><td>Negligible, Not Significant</td></tr>
<tr><td colspan="6">Cumulative Effects</td></tr>
<tr><td colspan="6">No significant cumulative impacts are expected to result, therefore no additional mitigation measures are proposed to address cumulative effects.</td></tr>
</table>

11.2 Conclusions

11.2.1 The Proposal is for the construction and operation of an Incinerator Bottom Ash Processing Facility at land within the south-eastern extent of the Hillhouse Enterprise Zone, located off South Road, Thornton-Cleveleys. The facility would have a maximum processing capacity of 350,000 tonnes of incinerator bottom ash per annum.

11.2.2 The ES has assessed and evaluated all potential significant, direct and indirect, environmental effects of the Proposal. Despite the fact that several environmental topics were included within the ES because they were considered as ‘likely’ to give rise to significant environmental effects, following assessment it was concluded that no significant effects exist. A range of mitigation and enhancement measures are proposed which would ensure any adverse environmental effects from the Proposal are minimised.

Hillhouse IBA Facility

Environmental Statement Chapter 11.0 Summary of Effects

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11.1.2 This chapter also summarises monitoring and/or enhancement measures (where relevant), and the consequential residual effects, following their assumed implementation.

11.1.3 The above information is provided in Table 11.1 below.

11.1.4 Schedule 4 of the EIA Regulations requires a description of the likely significant effects of a development. This description should cover the direct effects, and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. To provide further clarification on the nature of the effects, each has been identified in a tabular format and classified for the purposes of this summary as:

i) Short term (St) – effects occurring only over a short period of time. As the Proposed Development is designed (and assessed) to be permanent, medium-term effects (occurring for the duration of the Proposed Development's operation) and long-term effects (occurring beyond the operation of the Proposed Development) are deemed to be covered under 'permanent' effects (see below).

ii) Temporary (T) – effects that are not permanent because the effect would no longer occur if the impact was removed.

iii) Permanent (P) – effects that remain and cannot be readily reversed up to and beyond the cessation of the operation of the Proposed Development.

iv) Direct (D) – effects that result as a consequence of a direct impact.

v) Indirect (In) – also known as secondary effects, effects that result indirectly, but that are inevitably caused as a result of the Proposed Development.

Table 11.1 Summary of Likely Residual Effects

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
Chapter 6.0 Traffic and Transport					
Construction	Construction traffic	Not Significant	Measures to manage any potential adverse traffic effects would be detailed in a Construction Traffic Management Plan.	Not Significant	St, T, D
Operation	Assessment of the Proposal against 2026 Year of Opening	Negligible to Minor, Not Significant	None proposed.	Negligible to Minor, Not Significant	D, P
	Assessment of the Proposal against the 2031 Future Design Year				
	Driver Delay				
	Severance				
	Non-Motorised User Amenity (including Fear and Intimidation)				
	Decommissioning Night-time Effects (including lighting)				
Chapter 6.0 Ecology					
Construction and Decommissioning	Statutory Designated Sites	Negligible to Minor Adverse, Not Significant	Implementation of CEMP and appointment of Ecological Clerk of Works, Avoidance and Protection Measures detailed within Chapter 6.0.	Negligible to Minor Adverse, Not Significant	St, T, D
	Non Statutory Sites	Negligible to Minor, Not Significant		Negligible, Not Significant	
	Priority Habitats	Negligible, Not Significant		Negligible, Not Significant	
	Dust/emissions	Minor adverse, Not Significant		Negligible, Not Significant	

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
Operation	Statutory Designated Sites	Negligible to Minor Adverse, Not Significant	None proposed.	Negligible, Not Significant	D, P
	Non Statutory Sites	No impacts anticipated, Not Significant		Not Significant	
Chapter 7.0 Noise					
Construction	Effect of Vibration on Residential Receptors	Neutral, Not Significant	`Best practical means' (BPM) would be applied in accordance with BS5228-1:2009+A1:2014 to reduce and minimise impact during construction.	Neutral, Not Significant	St, T, D
	Effect of Vibration of Ecological Receptors	Neutral to Moderate, Not Significant		Neutral, Not Significant	
	Road Traffic Noise – All receptors	Minor, Not Significant	None proposed.	Neutral to Minor, Not Significant	
	Effect of Construction Noise on Residential Receptors	Neutral to Minor, Not Significant	BPM would be applied in accordance with BS5228-1:2009+A1:2014 to reduce and minimise impact during construction.	Neutral, Not Significant	
	Effect of Construction Noise on Ecological Receptors	Minor to Moderate, Not Significant	Avoid peak impulse noise events (e.g. piling, infrastructure and building steelwork construction) during the sensitive period for ecological receptors.	Slight to Minor, Not Significant	

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
			BPM would be applied in accordance with BS5228-1:2009+A1:2014 to reduce and minimise impact during construction.		
Operation	Effect of Operational Noise on Residential Receptors	Moderate, Not Significant	Numerous additional measures, including treatment of specific aspects of the buildings with acoustic cladding to the levels specified in Chapter 7.0.	Neutral, Not Significant	P, D
	Effect of Operational Noise on Ecological Receptors	Moderate, Not Significant		Minor, Not Significant	
	Operational Road Traffic Noise	Neutral to Minor, Not Significant	None proposed.	Neutral to Minor, Not Significant	
	Operational Vibration	Neutral, Not Significant	None proposed.	Neutral, Not Significant	
Decommissioning	Decommissioning Noise and Vibration on Residential Receptors	Neutral to Minor, Not Significant	BPM would be applied in accordance with BS5228-1:2009+A1:2014 to reduce and minimise impact during decommissioning. Measures controlled through a DEMP to limit effects.	Neutral to Minor, Not Significant	St, T, D
	Decommissioning Noise and Vibration on Ecological Receptors	Minor to Moderate, Not Significant	BPM would be applied in accordance with BS5228-1:2009+A1:2014 to	Neutral to Minor, Not Significant	

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
			reduce and minimise impact during decommissioning. Measures controlled through a DEMP to limit effects.		
Chapter 8.0 Air Quality					
Construction	Construction Dust	Not Significant	None proposed above BPM detailed within a CEMP.	Not Significant.	St, T, D
	Exhaust pollutants from Construction Phase Traffic	Negligible, Not Significant	None proposed above BPM detailed within a CEMP.		
Operation	Operational Phase Dust	Negligible, Not Significant	None proposed. Dust Management Plan (DMP) would be in place.		P, D
	Operational Phase Vehicle Emissions (Human Health)	Negligible, Not Significant	None proposed.		
	Operational Phase Vehicle Emissions (Ecology)	*(Screened out as Insignificant within Chapter 8.0, assessment presented at ES Appendix 8.4)*			
Decommissioning	Decommissioning and Demolition Dust	Not Significant	None proposed.	Not Significant.	St, T, D
	Exhaust pollutants from Decommissioning Phase Traffic	Negligible, Not Significant	None proposed above BPM detailed within a CEMP.		
Chapter 9.0 Ground Conditions					
Construction and Decommissioning	Human Health	Minor, Not Significant	Site investigation and quantitative risk assessment.	Negligible, Not Significant	

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
			Modular Compound Facilities and a CEMP/DEMP.		St, T, D
	Controlled Waters (Including Ecology and Ecosystems)	Minor, Not Significant	Site investigation and quantitative risk assessment (Construction only). Piling Risk Assessment and associated mitigation (Construction only). BPM detailed within a CEMP/DEMP.	Minor, Not Significant	
	Property	Negligible, Not Significant	Site investigation and quantitative risk assessment (Construction only). Piling Risk Assessment and associated mitigation (Construction only).	Negligible, Not Significant	
Operation	Human Health	Minor, Not Significant	None	Negligible, Not Significant	P, D
	Controlled Waters (Including Controlled Waters)	Negligible to Minor, Not Significant			
	Property	Negligible, Not Significant			
Chapter 10.0 Flood Risk and Drainage					
	Surface Water Quality	Negligible to Minor Adverse, Not Significant	Sign up to receive flood warnings from the Environment Agency.		

Development Stage	Environmental Effect (following development design and impact avoidance measures)	Level of Effect (following development design and impact avoidance measures)	Further Mitigation, Monitoring and/or Enhancement	Level of Effect (following further mitigation, monitoring and/or enhancement)	Nature of Effect
Construction and Decommissioning	Flood Risk Management	Negligible to Minor Adverse, Not Significant	Flood Warning and Evacuation Plan to be in place. Checks of Ryles Brook Culvert to ensure it remains free of debris. CEMP and BPM.	Negligible, Not Significant	St, T, D
	Infrastructure	Negligible, Not Significant			
Operation	Surface Water Quality	Negligible to Minor Beneficial, Not Significant	Sign up to receive flood warnings from the Environment Agency. Flood Warning and Evacuation Plan to be in place. Checks of Royles Brook Culvert to ensure it remains free of debris.	Negligible to Minor Beneficial, Not Significant	P, D
	Flood Risk Management	Negligible to Minor Beneficial / Minor Adverse (Minor Adverse to Site employees, visitors and local residents), Not Significant		Negligible to Minor Beneficial (Negligible effect to Site employees, visitors and local residents), Not Significant	
	Infrastructure	Negligible, Not Significant		Negligible, Not Significant	
Cumulative Effects					
No significant cumulative impacts are expected to result, therefore no additional mitigation measures are proposed to address cumulative effects.					

11.2 Conclusions

11.2.1 The Proposal is for the construction and operation of an Incinerator Bottom Ash Processing Facility at land within the south-eastern extent of the Hillhouse Enterprise Zone, located off South Road, Thornton-Cleveleys. The facility would have a maximum processing capacity of 350,000 tonnes of incinerator bottom ash per annum.

11.2.2 The ES has assessed and evaluated all potential significant, direct and indirect, environmental effects of the Proposal. Despite the fact that several environmental topics were included within the ES because they were considered as 'likely' to give rise to significant environmental effects, following assessment it was concluded that no significant effects exist. A range of mitigation and enhancement measures are proposed which would ensure any adverse environmental effects from the Proposal are minimised.

Hillhouse IBA Facility

Environmental Statement

Prepared for

Fortis IBA Limited

July 2024
3566-01-ES

Document Control

Revision	Date	Prepared By	Reviewed / Approved By
01	18/07/2024	LM	DA
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FOREWORD

The Environmental Statement (ES) has been prepared in support of a planning application submitted to Lancashire County Council (‘the Council’ or ‘LCC’) as Mineral and Waste Planning Authority (‘WPA’) by Fortis IBA Ltd (‘Fortis’ or ‘the Applicant’). The application relates to the construction and operation of an Incinerator Bottom Ash Processing Facility (‘the Proposed Development’) at land within the south-eastern extent of the Hillhouse Enterprise Zone, located off South Road, Thornton-Cleveleys (‘the Site’).

The ES has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as the ‘EIA regulations’) and comprises the following documents:

i) The Environmental Statement (ES) Main Report (including technical ES Chapters) contains the detailed project description; an evaluation of the current environment in the area of the Proposal; the likely significant environmental impacts of the scheme; and details of the proposed mitigation measures which would alleviate, compensate for, or remove adverse impacts identified in the study. The Main Report also includes a summary of the overall likely environmental effects of the Proposal, and a summary of additional mitigation, monitoring and/or enhancement measures, along with the residual effects following their assumed implementation;

ii) Illustrative Figures which contains relevant schematics, diagrams and illustrative figures;

iii) Technical Appendices which include details of the methodology and information used in the assessment (if required in addition to technical ES chapters), detailed technical schedules and, where appropriate, raw data;

iv) A Non-Technical Summary containing a brief description of the Proposal and a summary of the ES, expressed in non-technical language.

A Planning Statement has also been prepared in support of the planning application supported by a series of additional environmental appendices which were not considered likely to be ‘significant’ in EIA terms, and consequently not provided as part of the ES.

Hard copies of the Environmental Statement, as a four-volume set, are available at a cost of £600 by writing to Axis, Well House Barns, Chester Road, Chester, CH4 0DH. Alternatively, the Non-Technical Summary (NTS) can be purchased on its own from the same point of contact for £15, with the entire Environmental Statement available for purchase on a CD for £10.

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

1.1.1 This Environmental Statement (ES) has been prepared in support of a planning application submitted to Lancashire County Council ('the Council' or 'LCC') as Mineral and Waste Planning Authority ('WPA') by Fortis IBA Ltd ('Fortis' or 'the Applicant'). The application relates to the construction and operation of an Incinerator Bottom Ash Processing Facility ('the Proposed Development') at land within the south-eastern extent of the Hillhouse Enterprise Zone, located off South Road, Thornton-Cleveleys ('the Site').

1.1.2 The ES has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

1.1.3 This introductory chapter provides an outline description of the Proposed Development, describes the Site and its context, defines the structure of the ES, and identifies the organisation that has undertaken the Environmental Impact Assessment (EIA).

1.2 Proposed Development

1.2.1 The Proposed Development comprises an Incinerator Bottom Ash (IBA) processing facility, with a maximum processing capacity of 350,000 tonnes of incinerator bottom ash per annum.

1.2.2 Incinerator Bottom Ash is the non-combustible residue arising from the incineration of waste in Energy from Waste (EfW) plants. IBA is classified as a non-hazardous waste and can be processed to recover metals and prepare the remaining material for re-use. The recovered metals are exported to specialist facilities for onward recycling. The resulting product forms a secondary/recycled aggregate known as Incinerator Bottom Ash Aggregate (IBAA).

1.2.3 The recycling process maximises the removal of metals from within IBA, contributing to sustainable waste management and the recovery of resources. The resultant IBAA can be substituted for primary aggregates in a number of construction applications, diverting the material from landfill and reducing the need for primary-won aggregates and the associated environmental impacts.

1.2.4 The proposal would provide the required infrastructure to undertake the above IBA processing operation effectively and safely on Site, as well as related ancillary activity and facilities (e.g. administration, staff welfare, and security). The key elements of the Proposed Development are as follows:-

i) Processing plant, housed within a Processing Building comprising:
ii) Feed hopper;
iii) Modular plant including conveyors, magnets, eddy current separators and screens;
iv) Processing Building (a clad, steel portal-framed building measuring circa 17metres in height with a footprint of 2,200 m^2);
v) Metal Storage Bay Building, a 3-sided, steel framed cladded building, circa 10m in height;
vi) IBA and IBAA storage areas within a Storage Building circa 15m in height. This building would be a 3-sided, steel framed cladded building, with the north-eastern façade open to provide sufficient access for site traffic and mobile plant. The building measures 230 metres in length by 92 metres wide (at the widest section), occupying a footprint of 1.68 hectares;
vii) Demolition of the existing office building within the south-east of the Site;
viii) Modular office, laboratory and welfare units;
ix) 3 x standard 28ft containers, measuring 6 metres long by 3 metres wide for storage of site equipment;
x) Elevated conveyors to transport material between the Storage Building and the Processing Building;
xi) Retention of the pedestrian walkway spanning Royles Brook, connecting the two parts of the Site;
xii) Retaining wall (3 metres high at the Storage Building and Metal Storage Bay Building area; 2.1 metres high at the Processing Building area);
xiii) A purpose built, impermeable, sealed surface, to be provided in accordance with the requirements of the Environmental Permit being sought alongside the planning application;
xiv) Boundary treatments, a gated site access, weighbridges and wheelwash; and
xv) Parking for staff and visitors.

1.2.5 Further detail of the facility and the process that would take place at the Proposed Development is provided at Chapter 4.0 below.

1.3 The Applicant

1.3.1 The Applicant is Fortis IBA Ltd ('Fortis'), a wholly owned subsidiary within the Raymond Brown Group of Companies. Fortis is one of the leading companies in the UK providing facilities to recycle IBA arising from EfW plants. Fortis currently operates four IBA recycling facilities in Hampshire, Oxfordshire, Buckinghamshire and Kent, recycling c. 740,000 tonnes of IBA per annum.

1.4 The Site and its Surroundings

1.4.1 The Site is located within the Hillhouse Enterprise Zone, Thornton-Cleveleys, located to the south-east of the town of Fleetwood and on the western banks of the River Wyre Estuary. The location of the Site is shown on Drawings 3566-01-01 and 3566-01-02.

1.4.2 The Site is approximately 3.7 ha in area and comprises previously developed 'brownfield' land. The most recent use of the Site was as a manufacturing site for the production of polyvinyl chloride (PVC), with that use occupying the site between 1980 and 2020. The majority of buildings and infrastructure that previously occupied the Site were decommissioned, demolished down to slab level, and removed from site between October 2020 and May 2022, with demolition works for the same subject of an approved demolition method (which was granted pursuant to prior notification demolition application reference 20/00945/DEM). There are internal roadways and two buildings (a control room and a one storey office building) remaining from the PVC manufacturing facility which previously occupied the Site.

1.4.3 There are two main parts/sections to the Site with the first being a larger area of land set between the River Wyre (to the north east) and Royles Brook (to the south west), and the second being a smaller parcel set to the south west of Royles Brook, with these pieces of land linked by a culvert crossing over Royles Brook.

1.4.4 The Site is bound:

i) to the north-east by a public right of way ('PRoW'), with the River Wyre beyond;
ii) to the south and south-east by an area of woodland, beyond which is Flint's Caravan Park (at circa 40m to 120m from the Site boundary) and the Stanah Substation; and

iii) to the west and north-west by the remainder of Hillhouse International Enterprise Zone, comprising various employment and industrial uses, and vacant pieces of brownfield land.

1.4.5 The Site is accessed by a private road (South Road), which connects to other private estate roads within the Hillhouse International Enterprise Zone.

1.4.6 A detailed Scheme Description is provided at Chapter 4.0

1.5 This Document

1.5.1 As set out above, this document is the Environmental Statement (ES), which has been prepared to support the planning application for the Proposed Development.

1.5.2 In brief, Chapter 2.0 of the ES outlines the approach to the assessment describing the scope and structure of the ES, whilst Chapter 3.0 summarises the main alternatives studied by the Applicant. Chapter 4.0 provides a detailed scheme description. Chapters 5.0 to 10.0 assess the potential for the Proposed Development to result in likely significant environmental effects during its construction and operational phases. Finally, Chapter 11.0 summarises the assessment findings.

1.6 Assessment Team

1.6.1 In accordance with Regulation 18(5) of the EIA Regulations, the Applicant has engaged competent experts to prepare the ES.

1.6.2 The ES was compiled and coordinated by AXIS P.E.D Ltd (Axis), a multi-disciplinary planning, environmental and transportation consultancy. Axis is an established planning and environmental consultancy specialising in providing multidisciplinary planning support on major infrastructure development projects. Axis' project team includes: Chartered Town Planners; Members of the Chartered Institute of Ecology and Environmental Management; Members of the Chartered Institute of Highways and Transportation; Chartered Engineers; and Chartered Landscape Architects.

2.0 APPROACH TO THE ENVIRONMENTAL STATEMENT

2.1 Introduction

2.1.1 This Chapter sets out the legislative requirement for the application to be accompanied by an ES; the scoping process undertaken; the broad assessment approach that has been adopted, and finally how the ES complies with the requirements of the EIA Regulations.

2.2 Need for EIA

2.2.1 The requirement for EIA was prescribed by European law under Council Directive 85/337/EEC. This Directive has been amended four times, with the latest amendment, the Environmental Impact Assessment (EIA) Directive (2014/52/EU) entering into force on 15th May 2014.

2.2.2 In England, the Directive has been transposed most recently into law by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 [SI 2017 No. 571] – referred to hereafter as 'the EIA Regulations'. These regulations came into force on the 16th May 2017.

2.2.3 As a result of C-72/95 Kraaijeveld and others v Gedeputeerde staten van zuid-Holland (colloquially known as the "Dutch Dykes" case) the European Court of Justice concluded that the wording of the directive indicates that it has a "wide scope and broad purpose". This has been relied upon steadily ever since to mean that when determining whether a development should be subject to EIA, but it does not fall within a particular category or development type, one should consider it against a development description listed that most closely resembles that in question.

2.2.4 Schedule 1 of the EIA Regulations 2017 lists categories of developments for which EIA is mandatory, whilst Schedule 2 lists categories of development for which EIA may be required depending upon, inter alia, whether the development is likely to have significant environmental effects.

2.2.5 The Proposed Development comprises a facility to process IBA into IBAA. It would occupy a site with an area of circa 3.7 ha, and would have capacity to process up to 350,000 tonnes of IBA per annum.

2.2.6 The Proposed Development is not listed as a Schedule 1 development, and consequently mandatory EIA is not required.

2.2.7 The Screening Opinion identifies that the most similar equivalent development listed within Schedule 2 would be Category 10a ('Industrial estate development projects') or Category 11b ('Installations for the disposal of waste') of Schedule 2 of the Regulations. In both cases, the threshold for whether or not the development would comprise a Schedule 2 project is exceeded. In February 2024 a Screening Opinion (under Regulation 6 of the EIA Regulations 2017) was requested from LCC as to whether a development comprises EIA development. The Screening Opinion was issued in March 2024.

2.3 Scope of the ES

2.3.1 The Screening Opinion confirmed that the development is EIA development. On the basis of the content of the Screening Opinion, and subsequent discussion with the Planning Officer, the Environmental Impact Assessment assessed the following topics in detail, the findings of which are reported in this ES:

i) Traffic and Transport
ii) Ecology
iii) Noise Chapter
iv) Air Quality
v) Ground conditions
vi) Drainage and Flood Risk

2.3.2 The Screening Opinion determined that the Proposed Development was unlikely to result in significant environmental effects in relation to:

i) Cultural Heritage.
ii) Arboriculture.
iii) Landscape.

2.3.3 Nonetheless, these topics are considered as part of the Planning Statement.

2.3.4 In parallel to formally screening the application, the Applicant has been through a pre-application planning enquiry with LCC to help inform the content of the planning application and information required to be submitted in support of it.

2.3.5 The information and knowledge required to produce this ES was acquired from a number of varied sources to ensure that all effects, whether explicit from the outset, or coming to light during the project's development, were assessed. These sources included:

i) Discussions with technical consultees.
ii) Review of public files and records.
iii) Review of historical mapping and aerial photography.
iv) Site surveys undertaken by the Applicant.
v) Surveys and assessments undertaken previously on the Site.
vi) Specialist studies.
vii) Expert knowledge from the consultancy team.

2.3.6 The information to be included in an ES is set out in Schedule 4 of the EIA Regulations. References to chapters in the ES where information relevant to the requirements of Schedule 4 can be found are listed withing Table 2.1 below.

Table 2.1 – Review of Schedule 4 Requirements

Para	Requirement	Where Addressed Within the ES
1.	A description of the development, including in particular: (a) a description of the location of the development; (b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases; (c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.	(a) Chapter 1.0 and 4.0 (b & c) Chapter 4.0. (d) Chapter 4.0 as it relates to the scheme description and within Chapters 5.0 – 10.0.
2.	A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	Chapter 3.0
3.	A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline	Chapters 5.0 to 10.0 as it relates to individual topic areas

Para	Requirement	Where Addressed Within the ES
	scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	
4.	A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	Chapters 5.0 to 10.0 as they relate to individual topic areas.
5.	A description of the likely significant effects of the development on the environment resulting from, inter alia: (a) the construction and existence of the development, including, where relevant, demolition works; (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resource€(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste; (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; (g) the technologies and the substances used. The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union level (as they had effect immediately before exit day) or United Kingdom level which are relevant to the project, including in particular those established under the law of any part of the United Kingdom that implemented Council Directive 92/43/EEC and Directive 2009/147/EC.	Chapter 4.0 as it relates to the scheme description and within Chapters 5.0 to 10.0 as it relates to individual topic areas. As well as providing a detailed scheme description, Chapter 4.0 also sets out the vulnerability of the project to climate change. Chapter 2.0 includes consideration of the implications of the Finch Supreme Court Judgement in relation to the methodology of this ES.
6.	A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	The overall EIA methodology and approach to assessment is described in Chapter 2.0. The specific technical methodologies used to identify and assess effects are fully described (or referenced)

Para	Requirement	Where Addressed Within the ES
		within Chapters 5.0 to 10.0 as they relate to individual topic areas.
7.	A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	'Incorporated Mitigation' which forms part of the scheme design is described in the detailed scheme description provided in Chapter 4.0. Mitigation measures, as they apply to individual environmental topic areas, are described in Chapters 5.0 to 10.0 as they relate to each topic.
8.	A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to retained EU law such as any law that implemented Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or UK environmental assessments may be used for this purpose provided that the requirements of any law that implemented this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	The vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project is considered in Chapter 4.0.
9.	A non-technical summary of the information provided under paragraphs 1 to 8.	A separate Non-Technical Summary is contained as ES Volume 4.
10.	A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.	References are provided as footnotes and / or reference document lists within, or at the end of each ES Chapter, as appropriate.

2.3.7 In addition to this ES a series of supporting technical assessments have been provided as appendices to the Planning Statement, which accompanies the planning application. These assessments provide information to the planning authority on matters which were not deemed likely to result in significant effects on the environment, but which could be material planning considerations. These assessments include:

i) Landscape and Visual Appraisal
ii) Heritage Assessment.

iii) Energy Statement

2.4 Relationship with Other Regulatory Regimes.

2.4.1 In addition to obtaining planning permission, an Environmental Permit would be required from the Environment Agency (EA).

2.4.2 The legislation that governs the environmental permitting regime is in place to protect human health and the environment. In order to obtain an Environmental Permit sufficient information must be provided to the EA to satisfy them that the Proposed Development can be operated within the regulatory requirements established by UK and European legislation. As such, likely significant environmental effects would not occur as a result of emissions to air and water, due to this regulatory control.

2.4.3 Once the Environmental Permit has been issued the Proposed Development would be required to operate within the limits and conditions set out in the Permit. The Environmental Permitting process is a separate consenting regime to planning and the Applicant has commenced positive discussion with the EA in respect of the permit application and the information to be submitted.

2.4.4 Paragraph 194 of the National Planning Policy Framework (NPPF) sets out that:

"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities".

2.5 EIA Methodology

2.5.1 The approach to environmental impact assessment is not standardised, but there are established and recognised approaches set out by professional institutions as to methods to be used for the assessment of environmental effects. Where appropriate, the environmental effects of the Proposed Development have been assessed using definitive standards, legislation, and guidance applicable to each of the technical areas covered within this ES.

2.5.2 In order to provide a clear and robust assessment each of the technical chapters presented within the ES follows the structure set out in the subsequent paragraphs.

Introduction

2.5.3 A brief summary of the approach to the topic is provided outlining any key issues relevant to the subject area being assessed.

Methodology

2.5.4 This section provides details of the assessment method followed and provides the following information:

i) a description of any relevant legislation, policy or guidance which has been taken into account in the assessment;
ii) the findings from any consultations undertaken when compiling the assessment;
iii) the approach taken to gathering of any desk based or field data. When specific surveys have been undertaken an outline of the assessment methodology is provided;
iv) the approach to the impacts assessment is defined. This includes how the particular topic has defined impact magnitude, receptor sensitivity and how these relate to the overall level effect / significance; and
v) any limitations or assumptions made in the assessment.

Baseline

2.5.5 This section of the chapter provides a description of the baseline conditions of the Site relevant to the topic being assessed. The baseline conditions have been established through consultation, collation and analysis of existing datasets and reports, and gathering of site-specific field data. The baseline assessment identifies any particular sensitive receptors that will need to be evaluated in the effects assessment.

2.5.6 Where relevant, and in accordance with Paragraph 3 of Schedule 4 of the EIA Regulations an outline of the likely evolution of the environment is set out by predicting future natural change in the baseline conditions in the absence of the Proposed Development. The future baseline is then taken into account when assessing the likely effects of the project over its operational lifetime.

Assessment of Effects

2.5.7 This section of the chapter describes the likely significant environmental effects of the Proposed Development on the baseline condition of the Site and the surrounding area relevant to the assessment topic. The assessment includes a description of the nature, extent and significance of these effects. The assessment takes into account any mitigation measures that have been specifically incorporated into the Proposed Development to reduce environmental effects of the project.

2.5.8 The EIA Regulations do not provide definitive methods for the assessment of significance and a variety of methods are employed within Environmental Statements. The method used to assess the effects is specific to each discipline. Where available and appropriate, the assessments follow impact assessment criteria and methodology set out by relevant professional institutions, British Standards or non-statutory guidance. Where such guidance is not available, or prescriptive methods are not set out by the relevant professional body, then assessment criteria have been developed by the technical specialists to enable a clear and structured assessment to be undertaken.

2.5.9 The level of the effect of the Proposed Development is, in general, derived by considering the magnitude of the impact and the sensitivity of the receptor to a change resulting from the Proposed Development.

2.5.10 Depending on the discipline there are a number of factors that need to be taken into account when establishing the type and magnitude of an impact, including:

i) whether the impact is adverse or beneficial;
ii) whether it is temporary or permanent;
iii) extent or spatial scale of the impact;
iv) duration of the impact;
v) whether the impact is reversible; and
vi) probability / likelihood of the impact.

2.5.11 Similarly, the sensitivity of a receptor is the function of a number of elements dependent on the discipline and effect being assessed, these could include;

i) designation and legal status;
ii) quality;

iii) rarity; and

iv) ability to adapt to change.

2.5.12 Having established the magnitude of the impact and the sensitivity of the receptor, the level of the effect is then defined. For some disciplines a matrix is used to classify the level of effect by correlating magnitude of impact and sensitivity.

2.5.13 Where a matrix is not used the magnitude of impact and the sensitivity of the receptor is described and these factors are used to make a reasoned professional judgement to establish the level of the effect and whether it is considered to be significant or not significant.

2.5.14 There is no statutory definition of what level of effect is to be regarded as significant and there is often not a single, definitive, correct answer as to whether an effect is significant or not. A significant effect does not necessarily mean that such an effect is unacceptable to decision-makers nor necessarily results in a breach of any particular planning policy. This is a matter to be weighed in the planning judgement / balance alongside other material considerations. What is important is that the likely significant environmental effects of any proposal are transparently assessed and described in sufficient detail to enable the determining authority to make a balanced and well-informed judgement as part of the decision-making process.

2.5.15 Where the findings of an assessment are set out as different levels of effect (e.g. major, moderate, minor, etc) the assessment clearly sets out where an effect is considered to be significant. This may vary between disciplines and the threshold is defined within each chapter. This approach is used to assist the decision maker, consultees and other interested parties in establishing the most important environmental effects of the Proposed Development.

2.5.16 In all instances the assessment sets out the basis of the judgements made so that the readers of the ES can see the weight attached to the different factors and can understand the rationale of the assessment. In this sense the ES clearly explains how the significance of effects has been derived.

Mitigation

2.5.17 It is a requirement of the EIA Regulations to describe the measures envisaged to prevent, reduce and where possible offset any significant effects on the environment. Mitigation measures can be used to reduce or avoid any adverse effect, whether or not that effect is deemed to be 'significant'. Mitigation can be achieved in a number of ways as listed below; this approach is often referred to as the mitigation hierarchy with mitigation being selected as high up the hierarchy as possible.

Avoid
Reduce
Remediate
Offset / Compensate

2.5.18 Many of the mitigation measures within the Proposed Development have been incorporated as a result of decisions undertaken during the design of the scheme. Key 'incorporated' mitigation measures relevant to the technical assessments are described in each technical chapter. On the basis that these mitigation measures are considered to be embedded into the project they have been taken into account when coming to a judgement of the significance of the effects of the Proposed Development.

2.5.19 Where additional mitigation, compensation or enhancement measures are proposed to prevent, reduce or offset adverse effects unavoidable through design, or to provide benefits to the scheme / local environment these are described separately within the mitigation section of each chapter. Where such measures have been defined an explanation is provided of how these measures will mitigate / reduce the identified effects of the Proposed Development.

Cumulative Effects

2.5.20 The EIA Regulations require that a description of the likely significant effects of the development on the environment should be included in the Environmental Statement, including cumulative effects. On this basis each technical chapter will provides an assessment of likely significant cumulative environmental effects with other projects in the area.

2.5.21 The EIA Regulations do not define cumulative effects; however, a commonly accepted description is:

"Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project" (European Commission, 1999)

2.5.22 There is no defined methodology in the UK as to how cumulative effects should be assessed. Paragraph 5(e) of Schedule 4 of the EIA Regulations require a *"description of the likely significant effects of the development on the environment resulting from …. the culmination of effects with other existing and/or approved projects"*. In this regard the regulations are specific about the projects that should be considered to result in cumulative effects i.e. existing and/or approved projects. However, it is proposed to also include projects that are currently awaiting determination within the cumulative assessment as there is a possibility that these projects could be approved whilst the application for the Proposed Development is being determined. Accordingly, the assessment of cumulative impacts will encompass the effects of the Proposed Development in combination with:

i) approved development under construction;
ii) approved development, awaiting implementation; and
iii) proposals awaiting determination within the planning process with design information in the public domain.

2.5.23 The presence of existing operational schemes (and for some disciplines, schemes that are under construction, but not yet operational) is an established influence upon the environment, that will be taken into account when determining the baseline for the non-cumulative assessment for each discipline chapter. The assessment of effects section of each chapter has had full regard to the presence of such schemes when arriving at any conclusions.

2.5.24 As such, the additional schemes that would form part of the assessment of cumulative effects will be major projects subject to EIA that have either been granted planning consent but have not yet been constructed and major projects subject to EIA for which a planning application is awaiting determination. Other projects have been considered for inclusion in the cumulative assessment but have been excluded for reasons set out in the technical chapters, primarily due to separation distance and type of development.

2.5.25 The Zone of Influence (ZoI) will vary depending on discipline. However, it is considered unlikely that there would be any significant cumulative effects beyond 2 km for any discipline. As such this is the distance at which the initial screening of projects for potential cumulative effects has been undertaken. The projects identified for consideration in cumulative assessment work are:

i) 20/00405/LMAJ – The erection of 210 residential dwellings on land off Bourne Road;
ii) 19/00347/FULMAJ – A hybrid planning application consisting of full planning permission for the erection of 41 dwellings and outline permission for up to 45 dwellings and 42 apartments (all matters reserved except for access) at the site of the Thornton-Cleveleys Football Club;
iii) 23/01214/LCC – Proposed development of an Energy Recovery Centre and associated infrastructure (LCC/2023/0003); and
iv) 22/00762/FULMAJ – Proposed erection of 160 new dwellings on land located to the west of Fleetwood Road North, Thornton Cleveleys.

2.5.26 LCC did not identify any additional projects that it is aware of and which it considered have the potential to result in likely significant cumulative environmental effects through the Screening process.

Residual Effects and Conclusions

2.5.27 This section of each technical chapter provides a textual description of the likely residual effects of the Proposed Development following the implementation of any additional mitigation or enhancement measures.

2.5.28 The conclusions summarise the key elements of the assessment and include a statement on whether the Proposed Development is likely to result in any significant environmental effects.

2.6 Assessment of Indirect Effects

2.6.1 Schedule 4 of the EIA Regulations requires that the ES includes a description of the *"direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development"*. A recent judgement handed down by the Supreme Court in the case of Finch (Weald Action Group), R. (on the application of) v Surrey County Council & Ors [2024] UKSC 20 (20 June 2024) (hereafter referred to as the 'Finch

Supreme Court judgement'[1]) has crystallised this requirement, in particular the assessment of indirect effects.

2.6.2 In the Finch Supreme Court judgement, the Supreme Court ruled that the grant of planning permission for oil production in Surrey was unlawful for failing to assess the 'downstream' greenhouse gas (GHG) emissions that would arise from the combustion of the fuel, following refinement of the crude oil (i.e. those effects which would not occur 'but for' the proposed development irrespective of whether or not they are directly attributed to the proposed development). The main issue of the case was the consideration of indirect downstream emissions (or 'Scope 3 effects') and the need to assess these under the EIA Regulations. The EIA Regulations are designed to implement Directive 2011/92/EU, as amended by Directive 2014/52/EU.

2.6.3 The principles that have resulted from the Finch Supreme Court judgement are that indirect effects (be they downstream or upstream) must be considered where they would inevitably be caused by the development being applied for and where they are capable of evidence based meaningful assessment (i.e. where there is a recognised and quantifiable methodology of assessment that can be used), or whether any gaps in that assessment could reasonably be 'plugged'.

Downstream Effects

2.6.4 With regard to the implications of the Finch Supreme Court judgement on the Environmental Impact Assessment presented in this ES, the following has been considered:

v) The IBAA that would result from the Proposed Development is used predominantly as sub-base in the construction of new roads, or the repair of existing. Consequently, it could be argued that the Proposed Development indirectly leads both to carbon emissions from the process of road construction, but also from the use of vehicles on the resultant roads. Equally, the IBAA could be used in the manufacture of cycle lanes, footpaths and other carbon neutral options.

i) The EIA Regulations (in reflection of Directive 2014/52/EU) require information to be provided on the likely significant effects of a project on the environment.

[1] *https://www.supremecourt.uk/cases/docs/uksc-2022-0064-judgment.pdf*

The Finch judgement found that when determining whether an effect is "*likely*" for the purposes of the EIA Regulations, this should be based on evidence; if that evidence is absent or the effect is a matter of speculation or conjecture, then it would not be rational to regard it as "*likely*".

ii) In the case of an IBAA processing facility that manufactures to material to be used in a wide array of development locations and for a wide variety of potential uses (as set out at i), effects could not be attributed as 'inevitable' and the assessor could not adopt a meaningful evidence base for the purpose of assessment. Consequently, downstream effects cannot be construed as being 'likely' to occur.

2.6.5 The above view is supported by the reference within the Finch Supreme Court judgement to the examples of manufacturing components for vehicles or aircraft. Paragraph 122 of the judgement[2] states:

"Where a component is manufactured which forms a small part of a much larger object, such as a motor vehicle or aircraft, the view might reasonably be taken that the contribution of the component is not material enough to justify attributing the impact on the environment of the end product to the activity of manufacturing the component part. In any event, the number of motor vehicles or aircraft in which such parts will be incorporated and the use which will subsequently be made of them may be so conjectural that no realistic estimate could be made of GHG emissions arising from such use on which a reasoned conclusion could be based."

2.6.6 In the case of the IBAA facility, the road plaining from the facility would, in all likelihood, only amount to one small part of a much larger road construction or repair project (in much the same way as the analogy used within the Judgement with regard to vehicle parts). Consequently, the contribution of IBAA from the application Site is not sufficiently material to justify attributing the entire impact on the environment of a new road scheme or car park to the activity of producing the IBAA.

2.6.7 In light of the above, whilst it may be argued that there are indirect 'Scope 3' downstream effects arising from the production of IBAA insofar as it is used in product (a development) which itself could have a carbon impact, in accordance with

[2] ibid.

Finch, this should only be assessed as part of the Proposed Development in the event that the impacts are inevitably caused by the IBAA development (demonstrably not the case), and are capable of evidence based meaningful assessment (demonstrably not the case). For these reasons, and in accordance with the principles of the Finch Supreme Court Judgement, the downstream effects are scoped out of the EIA process.

Upstream Effects

2.6.8 Upstream effects are also required to be considered as indirect emissions. As set out previously, the raw material utilised by the Proposed Development is IBA; that is a residue resulting from EfW plants. It is not inevitable that IBA created by EfW plants would go to the Proposed Development, and the Proposed Development is not creating a demand for IBA that cannot already be met by existing EfW plants which function regardless of whether the Proposed Development comes forward or not. Consequently, there is not an ‘inevitable causation’ link upstream of the Proposed Development.

2.6.9 Some end users of IBAA require a small amount of primary aggregate to be blended into the product to form the desired IBAA composition. The importation of primary aggregates (circa 10,800tpa) is proposed to create this blended product. Primary aggregates are quarried and therefore it could be argued that indirect upstream effects would result from the production of a product using primary aggregate, in so far as the quarrying of the primary aggregate would have a carbon impact. The source of the primary aggregate is not currently known and therefore an assessor could not reasonably assess the impact of that quarrying operation. The amount is also extremely small meaning that no realistic estimate could be made of GHG emissions arising from the quarrying of that amount of aggregate, on which a reasoned conclusion could be based. Thus, the tests of ‘inevitable causation’ and ‘capable of evidence based meaningful assessment’ are not met in relation to the importation of primary aggregate to the Proposed Development.

2.6.10 Therefore, in accordance with the principles of the Finch Supreme Court Judgement, upstream effects are scoped out of the EIA process.

2.7 Structure of the Environmental Statement

2.7.1 The Main Report provides an introduction to the project, scope of the assessment, summary of alternatives considered, a description of the Proposed Development and details the technical assessments that have been undertaken to determine the likely impacts of the project. The chapters of the Main Report are as follows:

Chapter 1.0	Introduction and Background
Chapter 2.0	Approach to the Environmental Impact Assessment
Chapter 3.0	Alternatives Considered
Chapter 4.0	Scheme Description and Construction Methods
Chapter 5.0	Traffic and Transportation
Chapter 6.0	Ecology
Chapter 7.0	Noise
Chapter 8.0	Air Quality
Chapter 9.0	Ground Conditions
Chapter 10.0	Drainage
Chapter 11.0	Summary of Effects

2.7.2 Technical Appendices are provided where appropriate to provide additional background information to the technical chapters.

2.7.3 All the chapters of the Main Report are summarised in a Non-Technical Summary to provide a review of the development proposals, and the possible environmental implications, in concise lay terms.

3.0 ALTERNATIVES CONSIDERED

3.1 Introduction

3.1.1 Schedule 4 of the EIA Regulations identifies the information for inclusion in Environmental Statements. Paragraph 2 requires the following:

"A description of the reasonable alternatives (for example in terms of design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including comparison of the environmental effects".

3.1.2 It should be noted that the EIA Regulations place no specific obligation on a developer to study alternatives, but simply to describe them in the manner specified, where they have been considered.

3.1.3 In the case of the Proposed Development, and specifically the work undertaken leading up to the application, a number of alternatives have been considered. The subsequent sections provide a summary of these under the following headings:

i) 'Do Nothing' Alternative (IBA would go to landfill)
ii) Alternative IBA Processing Facility Locations
iii) Alternative HGV movement distribution across the week
iv) Alternative IBA storage Option (open windrow storage)

3.2 'Do Nothing' Alternative (IBA would go to landfill)

3.2.1 Other than processing into IBAA, the alternative destination for IBA is landfill. If this happens, opportunities to recover metals for recycling, manufacture a product from a material that would otherwise be disposed of, and reduce reliance on primary aggregate is lost.

3.2.2 Furthermore, by reducing the volume of waste (IBA) that would otherwise be sent to landfill, the Proposed Development would contribute to the preservation of finite void space for other waste that cannot be recovered and reused.

3.2.3 In light of the above, the Do Nothing Alternative is less sustainable and would manage waste further down the waste hierarchy. Thus, it is not considered to be preferable.

3.3 Alternative IBA Processing Facility Locations

3.3.1 In reflection of national and local policy and targets, a number of Energy from Waste facilities (EfWs) have been consented within Lancashire and the Joint Authorities as part of the drive to move away from reliance on landfill, and the need for delivery of reliable and dispatchable low carbon energy. There are a number of existing operational large EfWs within the northwest of England, with one of the UKs largest facilities located at Runcorn, and two further commercial scale mass-burn facilities approaching completion of construction at Ince Marshes and Lostock.

3.3.2 Locally, several EfWs have secured planning permission in recent years (at Heysham in Lancaster; east of Preston and at Blackburn beyond Lancashire, but still within the Joint Authority area). Most notably in April 2024 planning permission was granted (subject to completion of a Section 106 agreement) for a 120,000 tonne per annum capacity Thornton Energy Recovery Centre at Hillhouse Business Park (Reference LCC/2023/0003).

3.3.3 In accordance with the National Planning Policy for Waste (NPPW), the Applicant is not required to demonstrate a quantitative or market need for the proposal. However, it is clear that the growth in EfW locally and regionally places an increased need for facilities such as the Proposed Development in order to help ensure that IBA that arises as a consequential by-product is recovered and then used in the manufacture of a useable product. This is as opposed to IBA having to be sent to landfill for disposal due to the unavailability of local processing sites.

3.3.4 Furthermore, it is clearly beneficial that facilities such as that proposed, are located in relatively close proximity to the point of generation (the EfW network) so that the distance that IBA is required to be transported is reduced, and the consequential carbon footprint is kept to a minimum.

3.3.5 The Proposed Development would be located at a site that is appropriately allocated with good access to the main road network, and well located to receive IBA from a host of existing and potential future new facilities within the north-west region.

3.3.6 This ES has assessed and evaluated all potential significant, direct and indirect, environmental effects of the Proposal and assessment has concluded that no significant effects exist. A range of mitigation and enhancement measures are proposed which would ensure any adverse environmental effects from the Proposed Development are minimised.

3.3.7 Thus, the location of the Proposed Development is considered appropriate and sustainable. Consequently, no preferable alternative sites have been identified.

3.4 Alternative HGV movement distribution across the week

3.4.1 Residential properties are located along the access to the Hillhouse Enterprise Zone, along Bourne Road. During the assessment process, it was identified that there was an opportunity to reduce the number of HGVs travelling past these residential properties on a Saturday; the weekend period is recognised to be more sensitive from an amenity perspective than a weekday, due to background noise being quieter at the weekend. There would be no HGV deliveries on a Sunday.

3.4.2 In light of this, it is proposed that the number of HGV movements travelling to and departing from the Site on a Saturday would be limited. This could be implemented through use of a booking / logging system to manage HGV arrivals.

3.5 Alternative IBA storage Option (open windrow storage)

3.5.1 The Applicant operates IBA facilities where the IBA is stored and matured (a detailed process description is provided in Chapter 4.0) in the open air, rather than within a building, as is proposed through the Proposed Development. During the design process, cognisant of the Site context (residential properties within circa. 60 m south and ecological designations (of local to international importance) circa 60 m to the east), it was recognised that dust management would be critical to the operation of the Site.

3.5.2 As such, it was decided to house the IBA windrows within a 3-sided building as this would aid dust management processes. This design would also prevent rain from falling on the IBA and therefore provide the Operator with control over the amount of water added to the IBA during the maturation process. The Storage Building would also aid water management at the facility by providing the Operator with the ability to collect rainwater for use on Site, thus maximising water efficiency.

3.5.3 The north-east facade is open to facilitate air circulation to the IBA as it matures (a process which results in hydrogen gas and water vapour), without the need for mechanical ventilation. The open façade also facilitates IBA delivery via HGV, and mobile plant access to the windrows.

3.5.4 Therefore, the Proposed Development incorporates the 3-sided IBA Storage Building design.

3.6 Conclusions

3.6.1 The EIA Regulations require an ES to provide a description of the reasonable alternatives studied by the developer, and an indication of the main reasons for selecting the chosen option. The ES could go as far as concluding that no alternatives were considered, and the design taken forward for planning is the only realistic option available.

3.6.2 In this case, the Applicant has considered a number of potential options during the design and assessment process, and has confirmed why these have all been discounted, or incorporated into the Proposed Development. The application is considered the best option in all cases from a logistical, deliverable, viable and environmental perspective.

4.0 SCHEME DESCRIPTION

4.1 Introduction

4.1.1 The Proposed Development is for an IBA recycling facility, with a maximum processing capacity of 350,000 tonnes of incinerator bottom ash per annum.

4.1.2 The Proposed Development would operate 24 hours per day and 7 days per week (except during a night-time period 2300-0700 hours on a Saturday into a Sunday morning). Deliveries would be brought to the facility between the hours of 06.00 and 19.00 six days a week (Monday to Saturday) and no deliveries on Sundays or Bank Holidays.

4.1.3 The following sections of this Chapter set out:

i) a statement on IBA;
ii) overview of the IBAA production process;
iii) a description of the Site and the Site context;
iv) a detailed description of the project components;
v) a detailed description of the construction methods;
vi) a description of the drainage strategy;
vii) the potential for the Proposed Development to be affected / result in Major Accidents and Emergencies;
viii) the impact of the project on climate and the vulnerability of the project to climate change.

4.2 Incinerator Bottom Ash

4.2.1 Incinerator Bottom Ash (IBA) is the non-combustible residue arising from the incineration of waste in Energy from Waste (EfW) plants. IBA is classified as a non-hazardous waste and can be processed to recover metals and prepare the remaining material for re-use. The recovered metals are exported to specialist facilities for onward recycling. The resulting product forms a secondary/recycled aggregate known as Incinerator Bottom Ash Aggregate (IBAA).

4.3 IBA Production Process

4.3.1 The proposed IBA facility would take bottom ash from non-hazardous waste incinerators that accept municipal (household), commercial and industrial wastes, and process it into IBA aggregate (for use in the construction industry) and metals (for recycling at other facilities).

4.3.2 Prior to arrival at the Site, IBA is subject to hazard classification testing by EfW operators in accordance with the ESA (Environmental Services Association) Protocol. IBA is delivered to Site and stored (for 6-8 weeks) whilst the ESA testing results are pending. During this time oxidation, carbonation, hydration and hydrolysis reactions occur. This phase of the process is known as the maturation phase. Incoming IBA has an elevated water content (in the region of 22-24%) on arrival as a result of the quenching process at EfW facilities. The reactions during the maturation phase take up this water and also result in a reduction of alkalinity (pH levels) of the IBA material.

4.3.3 The maturation process is exothermic and results in stockpiles heating up to about 70 degrees C, often giving rise to steam being produced during processing on cold days.

4.3.4 Upon receipt of the ESA testing and confirmation that the waste meets the necessary criteria (European Waste Catalogue (EWC) code 19 01 12), the IBA can be processed. If the IBA is deemed hazardous following receipt of the ESA testing result, it is quarantined and then disposed of by the EfW operator.

4.3.5 The IBA processing operation is described below.

i) Following the maturation process, a loading shovel will feed the IBA into a feed hopper and a belt feeder will regulate the flow of material into the processing plant.
ii) Having entered the processing plant, the material will be passed over by a magnet which will remove any larger pieces of ferrous metal from the IBA. These metals are then sold on for recycling and reuse.
iii) The IBA material will then pass through a screen, which will separate the larger material. At this stage an operator will also remove any mixed oversize metal (typically oversized brick and concrete pieces). Crushing of oversize material may be required on a campaign basis.
iv) The finer material (typically <50mm) will then pass through a second screening process, separating material into processable fractions (typically fines / medium /large). Subsequently, the material will enter a metals separation process, which

will remove further ferrous material (such as batteries) and small particles of non-ferrous metals. These metals are also sold on for recycling and reuse

v) Screens are then used to split the remaining material into three size categories (fine (0-6 mm), medium (6-12 mm) and large (12-50 mm)). These three grades of material are then passed over a series of specialist equipment designed specifically for non-ferrous metal recovery. The non-ferrous metals are exported for recycling.

vi) The remaining material is then blended to form IBA Aggregate (IBAA). Some end uses (such as SHW Blend Series 800:Sub-base Type 1 IBAA) require a small amount of primary aggregate to be blended into the product to form the desired IBAA composition.

4.3.6 IBAA can be substituted for primary aggregates in a number of cosntruction applications, diverting the material from landfill and reducing the need for primary-won aggregates and associated environmental impacts winning of such material can give rise to.

4.4 The Site and Site Context

4.4.1 The Site measures 3.7 ha and comprises an area of previously developed ’brownfield’ land. There are two main parts/sections to the Site with the first being a larger area of land set between the River Wyre (to the north east) and Royles Brook (to the south west), and the second being a smaller parcel set to the south west of Royles Brook, with these pieces of land linked by a culvert crossing over Royles Brook.

4.4.2 The Site is bound:

i) to the north-east by a public right of way (‘PRoW’), with the River Wyre beyond;

ii) to the south and south-east by an area of woodland, beyond which is Flint’s Caravan Park and the Stanah Substation; and

iii) to the west and north-west by the remainder of Hillhouse International Enterprise Zone, comprising various employment and industrial uses, and vacant pieces of brownfield land.

4.4.3 The Site is accessed by a private road (South Road), which connects to other private estate roads within the Hillhouse International Enterprise Zone. Access to the

Hillhouse International Enterprise Zone is provided via Bourne Road (a Gatehouse and weighbridge are located at the entrance to the Enterprise Zone), which connects to the nearest adopted highway (Fleetwood Road North) to the north-west of the Enterprise Zone.

4.4.4 The Site is also set within close proximity to several international, national and local ecological designations, including the Wyre Estuary Site of Special Scientific Interest ('SSSI'); Morecambe Bay Ramsar Site; the Wyre-Lune Marine Conservation Zone; and the Morecambe Bay and Duddon Estuary Special Protection Area ('SPA'). As such, the Site falls within the Impact Zone for the SSSI, SPA and Ramsar site.

4.4.5 Large parts of the Hillhouse International Enterprise Zone are located within Flood Zone 2 (land assessed as having between 1 in 100 and 1 in 1,000 annual probability of flooding) and Flood Zone 3 (land assessed as having a 1 in 100 or greater annual probability of flooding). The Site is located within Flood Zone 3. The Environment Agency Historic Flood Map indicates that there are no records of flooding at or within the immediate vicinity of the Site.

4.4.6 The River Wyre is located approximately 60 m east of the Site and is tidally influenced. Royles Brook flows in a south-easterly direction between the main site and the processing area. After passing beneath South Road, Royles Brook outfalls to a watercourse known as Hillylaid Pool, which discharges to the River Wyre, approximately 390m to the south-east of the Site via Stanah pumping station. The River Wyre, Royles Brook and Hillylaid Pool are all classified as main river.

4.4.7 Stanah pumping station is located off River Road, beside the entrance to Wyre Estuary Country Park. The station was installed in the 1970's following flooding to low-lying land in the area. The pumping station automatically activates when levels rise in Hillylaid Pool to contain floodwater within the channel. The station is operated and maintained by the Environment Agency.

4.4.8 The nearest residential property is located approximately 300m to the south of the Site. However, static caravans for permanent occupation, are located within Flint's Caravan Park, found circa. 60m to the south of the Site.

4.4.9 There is one designated heritage asset within 1km of the site, the Grade II listed Raikes Farmhouse located circa 860m to the south.

4.5 Project Components

4.5.1 Site operations are segregated into three distinct areas as shown on Figure 1 namely:

i) Site entrance / office / weighbridge / car park complex area;
ii) IBA / IBAA Storage Shed / access road / metals storage area;
iii) Processing Plant Building / site office area.

4.5.2 Drawing 3566-01-03 shows the proposed Site Layout.

Site Entrance Area

4.5.3 The site entrance complex will be asphalt surfaced and include a car park (24 car space provision) and modular portacabins for the weighbridge and site offices. Two ramped weighbridges (in/out) are proposed for determining weights of imported IBA and minor tonnages of primary aggregate, and exports of IBAA.

4.5.4 Landscaping has also been incorporated into this area to provide opportunity for habitat creation.

4.5.5 A 3 m high galvanised steel security fence would be provided, featuring lockable gates at the Site access.

4.5.6 A two-storey modular site office would provide welfare/canteen facilities and toilets (ground floor); and managers office, general office and meeting room (first floor). The building measures 15 m in length and 6 m in width. Drawings 3566-01-07a and b provide detail of these structures.

4.5.7 The single storey weighbridge office would be a modular portacabin with a width of 3 m, length of 10 m and height of 2.5 m. This office would be located between two weighbridges. Drawing 3566-01-06 provides detail of the weighbridge office.

4.5.8 All buildings would be light grey in colour (RAL 7047 or similar).

IBA / IBAA and Metal Storage Area

4.5.9 The IBA/IBAA Storage shed, together with an access road and Metals Storage Shed represents the majority of the site area, measuring circa. 2.5 ha. This area lies entirely to the north of Royles Brook. It would feature an impermeable concrete hardstanding, sealed drainage system and 3m high perimeter retaining wall. Within this area, the IBA/IBAA stockpiles will be covered with a 3-sided steel framed building. A Metals Storage Shed would be located adjacent to the south-east boundary of the Site. The Metals Storage Shed would feature a façade which is partially open (the south-west facing façade).

4.5.10 The IBA/IBAA Storage Building would be a 3-sided, steel framed cladded building; with the north-eastern façade open to provide sufficient access for site traffic and mobile plant. The building measures 230 m in length and is 92 m wide (at the widest section), occupying a footprint of circa. 1.68 ha. The building is circa. 15 m in height to the eaves. Cladding for the building would be light grey in colour (RAL 7047 or similar). Drawing 3566-01-04 provides detail of the Storage Building.

4.5.11 The Storage Building would be internally divided into sections. The majority of the building would be used to store raw IBA in windrows. IBAA would be separated from the raw IBA and would be stored at the south-eastern extent of the Storage Building. The Site would be able to store up to approximately 120,000 tonnes of IBA and approximately up to 30,000 tonnes of IBAA. Stockpiles would be managed through spraying of collected rainwater and surface water runoff to expedite the maturation process and to assist in preventing wind-blown dust from arising. The Site will include a quarantine provision which would be able to store up to 250 tonnes of IBAA, should any waste compliance issue arise.

4.5.12 The Metals Storage Shed would be a steel framed cladded building. The building would be rectangular in footprint and would be 57 m in length, 36 m in width and 10m in height; occupying a footprint of 0.2 ha. Cladding for the building would be light grey in colour (RAL 7047 or similar). This building would provide bays for metals storage. Drawing 3566-01-08 provides detail of the Metal Storage Building.

4.5.13 A concrete surfaced access road would be provided for HGVs to travel from the weighbridge to/from the IBA/IBAA storage area. A wheel-wash would be provided for wheel cleaning of exiting HGVs.

4.5.14 A pedestrian footpath would run around the south-west perimeter of the retaining wall in the IBA/IBAA storage area, crossing over Royles Brook to the processing plant area. The footpath would provide safe, segregated access route for pedestrians walking from the site entrance complex to the processing plant area.

Impermeable Surface to be provided at the IBA/IBAA Storage Area

4.5.15 The IBA/IBAA storage area and processing plant area would require construction of a purpose built, impermeable, sealed surface, to be provided in accordance with the requirements of the Environmental Permit (subject of an application to be lodged with the Environment Agency in Q3 2024). Site investigation works are currently being undertaken but it is anticipated that ground remediation and/or ground improvement works would be required, prior to works to form the sub base and concrete slab.

4.5.16 Following completion of any land remediation and ground improvement as required, there would be minor areas of cut and fill of the existing material to achieve proposed falls and an imported stone capping layer would be provided to make up levels upon which to construct the hardstanding. The surface structure/hardstanding would then be constructed, comprising of a reinforced concrete slab, nominally 200mm thick on a membrane, on top of Type 1 subbase. Drawing 24-0045 C10851 B provides detail of the existing and proposed levels. The external circulation areas serving the storage areas would fall towards the stockpiles in the IBA/IBAA storage building; this would aid the management of water and its reuse in the processing operation.

4.5.17 The combination of engineered levels of the slabs and the retaining walls would provide a minimum perimeter boundary level of 6.5 metres Above Ordnance Datum (mAOD) to all operational areas.

Processing Plant Area

4.5.18 Raw IBA and IBAA would be transported between the IBA / IBAA Storage Shed Building via overland conveyors linking the two buildings. These conveyors would be covered to prevent wind-blown dust arising. The conveyors would be elevated to circa. 4.6 m above ground to provide sufficient clearance of the vegetation at Royles Brook, and the access track (adjacent to the north-eastern boundary of the brook, outside the Site boundary) which is to be retained to facilitate access for the Landlord to the substation to the north-west of the Site.

4.5.19 The Processing Plant Building would be predominantly rectangular in shape, with a small ‘stub’ extending from the south-west elevation. The dimensions of the building are 65 m in length and 32 m at the widest point. The building would be circa. 17 m in height. Cladding for the building would be light grey in colour (RAL 7047 or similar). Drawing 3566-01-05 provides detail of the Processing Plant Building.

4.5.20 The Processing Plant Building would contain the plant necessary to process the IBA into saleable aggregates and recover metals. The plant would include an arrangement of modular plant comprising conveyors, magnets, eddy current separators and screens.

4.5.21 A separate Picking Station structure would be provided adjacent to the Processing Plant Building. This structure would be circa 8m in height, 3 m wide and 6m long. Conveyors would feed material between the Picking Station and the Processing Plant Building.

4.5.22 Adjacent to the south-western boundary of the processing plant area, a canopy structure would be provided to provide covered storage of metals in metal skips prior to them being transferred to the Metal Storage Building (via the existing access road to the Site Entrance).

4.5.23 Within the processing plant area, there would also be a two-storey portacabin providing: site office, welfare facilities, toilets and laboratory (aggregate testing). This portacabin would be circa. 5 m in height and measure 3 m wide by 24 m long, providing 144m² of floor space.

4.5.24 There would also be 3no. standard 28ft containers, each measuring 6 metres long by 3 m wide and to be used for the storage of site equipment.

4.5.25 The Processing Plant Area would also feature a retaining wall (2.1 m in height) and would be constructed with an impermeable concrete hardstanding. A 3 m high galvanised steel palisade security fence would also be provided at the Processing Plant Area. Vehicle access would be available via the southern side of the Processing Plant Area, to enable metal skips to be transported via tractor/tipping trailer to the Metal Storage Building in the main part of the facility.

4.6 Construction

4.6.1 It is currently anticipated that construction would commence in Q3 2025 and last approximately 16 months.

4.6.2 Construction traffic would access the Site via the South Road of the Hillhouse Enterprise Zone. A Construction Traffic Management Plan (CTMP) would be prepared and would ensure routing of construction traffic on the wider highway network is on agreed haulage routes, and would set out mitigation of any adverse effects from construction traffic.

4.6.3 The core construction hours are proposed to be 7:00am to 7:00pm during weekdays (Monday – Friday) and 8:00am to 1:00pm on Saturdays. No work is planned on Sundays or bank holidays, however there may be occasions when construction would need to be undertaken outside of the core hours, for example, during major concrete pours or the transfer of abnormal loads.

4.6.4 Lighting during construction would need to be sufficient to satisfy health and safety requirements, whilst ensuring impacts on surrounding environment, including from sky glow, glare and light spillage, are minimised. Artificial lighting would only be used during the hours of darkness, low levels of natural light or during specific construction tasks to ensure the health, safety and welfare of those on site, including construction staff and visitors.

4.7 Contractors Construction Compound

4.7.1 A temporary construction compound would be created. This compound would be located adjacent to the Site.

4.7.2 The compound would include temporary office buildings and welfare accommodation; a fuel store; designated equipment laydown area; and a small parking area for construction workers.

4.7.3 The temporary construction compound would be established under Permitted Development Rights (Part 4, Class A of the Town and Country Planning General Permitted Development Order) which would allow for the construction and operation of the compound during the construction of the facility. The construction compound would be removed and restored upon completion of all temporary construction works.

4.8 Drainage Strategy

4.8.1 Within the Processing Plant Area, surface water runoff from external areas would drain to a dirty water tank via an open channel. The dirty water tank would be located in the north-western corner of this portion of the Site and the tank would be bunded. Collected water would be used onsite for IBA treatment.

4.8.2 Surface run-off draining from the access road, adjacent to the IBA/IBAA Storage Shed would be diverted to the Storage Shed and used for IBA treatment and dust suppression.

4.8.3 Surface water runoff from the Site Entrance Area would be directed to perimeter drains and discharged into the local drainage system.

4.8.4 Surface water would be collected from the rooves of the IBA / IBAA Storage Shed, the Metals Storage Shed and the Processing Plant Building. This water would be stored in tanks for use in dust suppression and the wheel wash. The largest of the storage tanks is located in the north-western extent of the Site. This tank would measure approximately 800 m^2 in footprint and would provide circa 880 m^3 of attenuation volume.

4.8.5 There would be a discharge pipe to provide discharge of clean water to Royles Brook, to be used as required.

4.8.6 The Site will not have any trade effluent discharge requirements.

4.8.7 Foul water from the offices and weighbridge area will be treated on site and discharged to Royles Brook. Foul water from the plant area will also be treated on site, including UV filtering, and discharged into the surface water drainage system and stored in the above ground tanks for later use.

4.9 Access

4.9.1 The Site is accessed by a private road (South Road), which connects to other private estate roads within the Hillhouse International Enterprise Zone. Access to the Hillhouse International Enterprise Zone is provided via Bourne Road (a Gatehouse and weighbridge are located at the entrance to the Enterprise Zone), which connects to the nearest adopted highway (Fleetwood Road North) to the north-west of the Enterprise Zone.

4.9.2 HGVs would utilise the local road network comprising, Bourne Road/Bourne Street, B5268 Fleetwood Road North, Bourne Way and the A585 Amounderness Way, linking to the M55 for wider importation of IBA and distribution of IBAA.

4.9.3 The Proposed Development includes the provision of white road markings to provide clarification of the priority of the junction on South Road which provides access to the Site and access to the neighbouring businesses. The Proposed Development would give rise to more vehicle movements than the neighbouring uses, and therefore it is proposed to change the priority of the junction to make it clear that the Proposed Development has priority.

4.9.4 Security gates would be provided at the Site access.

4.10 Landscaping

4.10.1 The landscape proposals for the Proposed Development are illustrated indicatively on Drawing 3566-01-03 Rev A. The landscaping comprises areas of mixed scrub to be provided for the purpose of habitat enhancement.

4.11 Lighting

4.11.1 External lighting would be necessary to ensure a safe working environment during hours of darkness (including the beginning and end of the working day in winter) and for security. Lighting would be inward and downward orientated low-intensity lighting. Any lighting scheme would be designed to prevent nuisance glare and minimise light trespass, minimising impacts to adjacent habitats.

4.12 Construction Environmental Management Plan (CEMP)

4.12.1 A CEMP would be developed for the construction phase of the development. The purpose of the CEMP would be to manage and report environmental effects of the project during construction. The CEMP would set out how environmental issues would be managed in accordance with relevant legislation, regulations and best practice guidance. It would be the responsibility of the main contractor to develop and enforce the CEMP. It is suggested that the requirement for a CEMP to be prepared is subject to a planning condition once the detailed design is completed to allow main contractor input.

4.12.2 The objectives of the CEMP would be to:

i) Highlight environmental impacts resulting from the development and identify sensitive receptors to the construction team;
ii) Reduce and manage environmental impacts through appropriate construction methods;
iii) Reduce and manage environmental impacts through implementing environmental best practice during the construction period;

iv) Undertake ongoing monitoring and assessment during construction to ensure environmental objectives are achieved;
v) Provide emergency procedures to protect against environmental damage;
vi) Provide an environmental management structure for the construction stage;
vii) Recommend mechanisms to reduce risk of environmental damage; and
viii) Ensure procedures are in place for consultation with EA, Natural England, Council Officers and other stakeholders throughout the works if necessary.

4.12.3 Prior to the commencement of construction works an environmental walkover would be undertaken to establish any changes in the environmental baseline since the surveys undertaken as part of the EIA and planning submission. This walkover would be used to update any of the defined construction procedures as necessary.

4.13 Decommissioning

4.13.1 Permanent planning permission is sought for the Proposed Development. As with any form of technology or structure, plant and machinery or parts of other structures would be replaced as and when required, either because more efficient technology come on the market, or they need replacing due to natural wear and tear.

4.13.2 If at some point in the future, the facility is no longer deemed necessary or sustainable by the Operator, the facility would be decommissioned. Decommissioning would require similar plant to the construction phase of the facility and would result in very similar impacts.

4.14 Consideration of Major Accidents and Emergencies

4.14.1 Schedule 4 paragraph 8 of the EIA Regulations requires that the ES includes a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters which are relevant to the project concerned. Further, that where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events and the approach to managing emergencies.

4.14.2 The reference to disasters is interpreted to relate to natural events, as indicated by the preamble to the 2014 Directive (2014/52/EU) which states at paragraph 15:

"In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment".

4.14.3 Nonetheless, it is recognised that disasters can occur as a result of human intervention e.g., conflict and war, political influences etc.

4.14.4 In relation to major accidents the EIA Regulations refer to Directive 2012/18/EU (the control of major-accident hazards involving dangerous substances). This directive defines major accidents as:

"an occurrence such as a major emission, fire, or explosion resulting from uncontrolled developments in the course of the operation of any establishment covered by this Directive, and leading to serious danger to human health or the environment, immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances."

4.14.5 The Proposed Development is located within a politically, geologically, and meteorologically stable part of Europe. Accordingly, the Proposed Development is not at material risk from, for example, civil unrest, war, earthquakes, or extreme weather conditions (hurricanes etc.).

4.14.6 In terms of any vulnerabilities specific in this location (i.e., on the Site), the risk of flooding to the Proposed Development is assessed to be low, albeit there is a residual risk of flooding from failure (breach) of the River Wyre tidal defences and due to blockage of the inlet of the existing access crossing culvert on Royles Brook adjacent to the Site. However, the Flood Risk and Drainage Assessment (ES Appendix 10.1) details the mitigation measures incorporated into the Proposed Development to mitigate the risk of flooding.

4.14.7 The Proposed Development is not considered to be vulnerable to any other potential 'natural' events that could result in significant environmental effects. The Site is a former polyvinyl chloride (PVC) manufacturing site, and consequently there are potential hazards associated with working on, in and around the Site. The construction works would be carried out in accordance with a bespoke Construction Environmental Management Plan and good practice / British Standard construction measures.

4.14.8 With regard to major accidents the 2014 Directive describes that:

"it is important to consider their [i.e., the Proposed Development] vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment."

4.14.9 The focus here, as it is within the EIA Regulations, is on the vulnerability of the Proposed Development to major accidents and/or disasters and the <u>likelihood</u> of significant adverse effects occurring.

4.14.10 The creation of the facility would principally involve the construction of steel portal, cladded buildings and modular units, demolition of an existing office building, provision of a retaining wall and sealed concrete surface; these activities would be inert in nature. The Proposed Development would not lead to any major risk of emission, fire, or explosion. The developer is experienced in the operation of similar facilities and is familiar with the necessary dust management measures. Electrical infrastructure, in the form of a substation, transformer and cabling used in the Processing Plant Area, would be subject to regular routine maintenance and inspection such that it would not pose a significant risk to creating an accident.

4.14.11 Based upon the foregoing, the Proposed Development would not give rise to significant adverse effects on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters.

4.15 Impact of the project on climate and the vulnerability of the project to climate change

4.15.1 Paragraph 5(f) of Schedule 4 (Information for inclusion in Environmental Statements) of the EIA Regulations 2017 requires that applicants provide a description of the likely significant effects of development on the environment resulting from the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change.

4.15.2 The effects of climate change and increased global warming are already being witnessed around the world. The result is increased sea levels, warmer and wetter winters, hotter and drier summers, and more frequent and intense weather extremes. In the UK this means that areas prone to flood risk are more likely to be inundated by extreme flood events, and consequently development is required to be designed cognisant of these effects.

4.15.3 The Flood Risk and Drainage Assessment (FRDA) (ES Appendix 10.1) provided in support of the application has been undertaken with regard to the provisions in the NPPF and Policy CDMP2 of the Wyre Local Plan (WLP) (2011-2031) (incorporating the partial update of 2022). The FRDA identifies the risk of flooding to the Proposed Development is assessed to be low, albeit there is a residual risk of flooding from failure (breach) of the River Wyre tidal defences and due to blockage of the inlet of the existing access crossing culvert on Royles Brook adjacent to the Site. Mitigation measures to address this risk have been incorporated into the Proposed Development.

4.15.4 Section 2.6 of this ES provides consideration of the Finch Supreme Court judgement and the implications of the judgement on this ES.