NOISE IMPACT ASSESSMENT

Units 9 & 10, Vauxhall Industrial Estate, Ruabon, Wrexham LL14 6HA

New Horizon Biofuel and Animal Bedding Co Ltd

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1.5	16/01/2023	TB/CP	--	Additional noise sources and revisions
1.6	06/02/2023	TB/CP	--	NRW comments

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Drawing No. VIE/2704/03 –Site Layout & Fire Plan

Drawing No. VIE/2704/04 – Receptor Plan

1 Introduction

1.1 Background to Report

1.1.1 Oaktree Environmental Ltd have been commissioned by New Horizon Biofuel and Animal Bedding Co Ltd to undertake a Noise Impact Assessment (NIA) for a site situated at Units 9 & 10, Vauxhall Industrial Estate, Ruabon, Wrexham LL14 6HA.

1.1.2 This report is to be submitted in support of a permitting application to Natural Resources Wales (NRW).

1.1.3 This report utilises measurements of plant/equipment and background noise levels taken by Oaktree Environmental Ltd in order to provide an assessment of the noise associated with the site as per BS4142:2014.

1.1.4 This document has been prepared by Thomas Benson of Oaktree Environmental Ltd who is an associate member of the Institute of Acoustics with a level of qualifications and experience commensurate with those described within the replacement noise guidance issued by NRW. A full CV can be provided separately, if required.

1.2 Site location

1.2.1 The site is located on Land at Units 9 & 10, Vauxhall Industrial Estate, Ruabon, Wrexham LL14 6HA. The national grid reference for the site is SJ 30519 45317. The site is bounded by the surrounding commercial estate to the north, west and south whilst the Shrewsbury to Chester rail line lies to the east with wooded areas and open fields beyond.

1.2.2 Access to the site is via the access road to the northwest.

1.2.3 The site is located within a primarily industrial setting with the nearest residential dwelling located approximately 290m from the site boundary.

1.3 Hours of operation

1.3.1 The site will be operated in accordance with the following hours:

- **Unit 9**= 24/7 Monday – Friday and closed Weekends and Bank Holidays.
- **Unit 10** = 24/7 Monday – Friday and closed Weekends and Bank Holidays.
- Both sites will be completely shut down for two days per month to provide a full operational clean up.

1.3.2 In the event that the site is closed or not in operation for any reason, the gates will be locked and secured to prevent unauthorised vehicular and/or pedestrian access and a 24-hour security presence will be maintained to monitor waste and product stocks.

1.3.3 The following operations will take place at the site during the following hours:

Table 1.1 – Operational hours and activities

Site activities	Operational hours	Comments
Waste acceptance and removal of plastic	Monday to Friday = 24/7 Saturday = Closed Sundays = Closed Bank/Public holidays = No operations	Plastic is delivered to the site in HGVs comprising articulated bulker wagons and 8-wheelers. All plastic accepted at the site will be either in bale form or within shrink wrapping on wooden pallets so the waste can be unloaded using a forklift truck. No waste is expected to arrive loose at the site and tipped on the floor.
Activities on Unit 9	As above operational hours	This site comprises the main hub for the facility and will include the use of mechanical mobile plant i.e. 360^0 excavators feeding the shredder which will feed into the wash plant. The fixed plant shown on Drawing No. VIE/2704/03 will also be in operation during these hours.
Activities on Unit 10	As above operational hours.	This site will only be used for unloading and loading of plastic containers using forklift trucks. No mechanical treatment will take place at this site.
Maintenance/housekeeping on Units 9 & 10	Monday to Sunday = 06:00 – 07:00 Monday to Sunday = 19:00 – 21:00 Bank/Public holidays = No operations	During these hours, operations will consist of removing of waste material which may have accumulated around the treatment plant during loading and returned to the relevant stockpile. This will also involve cleaning the fixed plant and removing any dust or fluff which may have accumulated during the working day. This will not involve using any mechanical machinery after the hours of 19:00. The only time mechanical machinery would be used after 19:00pm would be for an emergency situation i.e. a fire incident.

2 Sensitive Receptors

2.1 Noise Sensitive Receptors

2.1.1 The site lies within a primarily industrial setting within the Vauxhall Industrial Estate with the nearest residential noise sensitive receptors are approximately 290m to the northwest on Ruabon Road, 320m northwest on Moreton Avenue and 300m north on Heol Kenyon.

2.1.2 Numerous other noise emitting operators are also located within 250m of the application site, with uses including automotive repair and servicing yards, oil recycling and disposal sites, powder coating and printing shops amongst others.

2.1.3 In terms of limiting potential noise impact, a site-specific Noise Management Plan (Document Ref. VIE-2704-H) taking into account the findings of this report has also been prepared in order to ensure the noise levels at the site can be managed further and reduce any impact on the surrounding receptors. The proposed operation and mitigation measures for the site has been planned in conjunction with the acoustic assessment carried out by Oaktree Environmental and submitted to Natural Resources Wales (NRW) and therefore, has been designed with limiting the impacts from noise on the above receptors in mind.

3 Noise Assessment Criteria

3.1 Overview

3.1.1 In order to assess the impacts of existing road traffic and industrial noise on the proposed development, the following documents have been used:

- BS8233:2014
- BS4142:2014
- World Health Organisation (WHO) Guidelines on Community Noise

3.2 BS8233:2014

3.2.1 This document provides guidance on the relevant level of sound insulation required by a variety of building types affected by general environmental noise and provides recommendations for appropriate internal ambient noise level criteria for a variety of different situations including residential dwellings. The table below includes the proposed noise criteria within BS8233:2014 with regards to residential properties:

Table 3.1 - BS8233:2014 Internal Criteria

Activity	Location	07:00 – 23:00	23:00 – 7:00
Resting	Living rooms	35 $L_{Aeq, 16hour}$	-
Dining	Dining room	40 $L_{Aeq, 16hour}$	-
Sleeping	Bedroom	35 $L_{Aeq, 16hour}$	30 $L_{Aeq, 16hour}$

3.3 BS4142:2014

3.3.1 BS4142:2014 provides a method for assessing and rating sound of an industrial / commercial nature. The method described in the standard uses the rating level from a noise source and the existing background noise level to assess the potential effects of sound on the residential premises upon which sound is incident.

3.3.2 Using this method the background sound level is subtracted from the rating level. The resulting figure is assessed using the following guidance from the document:

- The greater the difference between the background sound level and the rating level, the greater the impact on the receptor.
- An exceedence of the background level of around 10dB or more is likely to be an indication of a significant adverse impact, dependent on the context.
- An exceedence of the background level of around 5dB is likely to be an indication of an adverse impact, dependent on the context.
- The lower the rating level compared to the existing background level, the less likely an adverse impact or a significant adverse impact. Where the rating level does not exceed the background level, this is indicative of a low impact, dependent on context.

3.3.3 The document introduces a requirement to consider and report the uncertainty in the data as well as also including guidance for applying a correction/penalty for certain adverse acoustic features such as tonality, impulsivity or intermittency. The following table summarises the corrections based on the subjective assessment of the noise.

Table 3.2 - BS4142:2014 Corrections and Penalties

	Tonality	**Impulsivity**	**Other characteristics**
Just perceptible	+ 2dB	+ 3dB	
Clearly perceptible	+ 4dB	+ 6dB	
Highly perceptible	+ 6dB	+ 9dB	
Readily Distinctive against Residual Environment			+ 3dB

3.4 WHO Guidelines for Community Noise

3.4.1 The WHO Guidelines (1999) recommends indoor night-time guidelines in order to avoid sleep disturbance, the document states these to be 30 dB (LAeq)and 45 dB (LA_{fmax})for continuous and individual noise events respectively.

3.4.2 The document states that the number of noise events should also be considered and that individual noise events should not exceed 45 dB (LA_{fmax})more than 10 – 15 times per night.

3.4.3 The WHO document also recommends that steady, continuous noise levels should not exceed 55 dB (LAeq) on outdoor living areas (balconies, terraces etc.). However, in order protect the majority of individuals from moderate annoyance, external noise levels should not exceed 50 dB (LAeq).

4 Existing Noise Climate and Background Levels

4.1 Procedure and Monitoring Locations

4.1.1 A background noise survey in accordance with BS 7445-1: 2003 by Thomas Benson of Oaktree Environmental Ltd. Attended background level measurements were taken at locations representative of the nearest noise sensitive receptors within the vicinity of the site from 19th to the 21st January 2022.

4.1.2 The methodology also allowed for attended measurements to be taken of the background level. The methodology has the benefit of allowing for significant level of observation to be made on the existing noise climate at the nearest residential receptors which adds context to the figures surveyed. BS4142 makes numerous comments in relation to context and therefore it was considered that this approach was more beneficial than longer term unattended measurements. The site was not operational when measurements were taken.

4.1.3 Should It be required, photographs and videos can be provided, along with the noise measurement files to corroborate the above observations. These are available upon request by NRW. The measurement locations are presented within the Noise Monitoring Plan within Figure 4.1 below and further scaled map in Appendix I.

Figure 4.1 – Noise Monitoring Locations

4.1.4 The approximate NGR for the above monitoring point is SJ 30272 45560. This point is approximately 298m from the site access of Unit 9 and 250m from Unit 10. The proposed use of Unit 10 only comprises the storage and handling of containers and it is considered there would not be any excessive noise arising from the site. In terms of Unit 9, the monitoring point is approximately 325m from the external shredder and 340m from internal plant which is considered to be the continuous noise sources associated with the site.

4.1.5 Between the above monitoring point and the site comprises a building occupied by Brother Industries UK Ltd measuring approximately 145m in length and 8m – 10m high from the eaves to the roof. The remaining 150m to the site comprises relatively flat industrial land occupied by numerous yards. This is detailed with the NMPA drawing shown in Appendix I.

4.2 Equipment Used During the Survey

4.2.1 Details of the equipment used during the survey are shown below in table 5.2:

Table 4.2 - Survey Equipment

Description	Model	Manufacturer	Serial No.	Calibration Date
Class 1 Sound Analyser	NOR 150	Norsonic	15030504	02/10/2020
Microphone	Norsonic Type 1225	Norsonic	305208	02/10/2020
Field Calibrator	NOR 1251	Norsonic	35205	03/03/2021

4.3 Results

4.3.1 The results of the background noise monitoring survey are tabulated below and overleaf within tables 4.3 to 4.5 for Noise Monitoring Position A.

Table 4.3 – Weekday Evening Measurement Results for Noise Monitoring Position A (NMP A)

Measurement Time	LA_{eq}	LA_{90}	LA_{10}	LA_{max}
19/01/2022 22:00-23:00	51.1	40.8	45.5	82.5

Table 4.4 – Weekday Night Measurement Results for Noise Monitoring Position A (NMP A)

Measurement Time	LAeq	LA90	LA10	LAmax
19/01/2022 23:00-00:00	43.2	40.1	43.1	62.3
20/01/2022 00:00-01:00	40.7	38.9	41.6	58.9
20/01/2022 01:00-02:00	41.3	38.6	41.1	64.7

Table 4.5 – Weekday Morning Measurement Results for Noise Monitoring Position A (NMP A)

Measurement Time	LA_{eq}	LA_{90}	LA_{10}	LA_{max}
21/01/2022 09:11 – 10:11	46.7	42.7	48.4	65.3
21/01/2022 10:28 – 11:28	48.6	44.0	50.3	68.5

4.4 Existing Noise Climate

4.4.1 The existing noise climate at NMP A typically comprised; local road traffic movements associated with residents as well as industrial noise associated with the manufacturing unit directly to the south of the residential dwellings. This included forklift movements, a steady tonal hum from the ventilation units and audible noise from within the building itself.

4.4.2 During night-time, contributions from the manufacturing plant were noticeably reduced as were the vehicle movements, however these remained the largest contributors to the night-time background level.

4.4.3 Additional, more sporadic, and low-level noise sources included birdsong and passers-by, dog walkers etc.

5 Noise Impact Assessment

5.1 Proposed Operations

5.1.1 Noise sources associated with the operation of the site are considered to comprise the internal treatment process, external shredder and the loading/unloading of curtain sided lorries using the sites forklift truck. During the daytime the shredder will be used to feed the internal treatment system and roller shutters will largely remain open.

5.1.2 The wood treatment plant has been excluded from the assessment as this is regulated by the Local Planning Authority under a Part B permit and the pelleting line. The storage and processing wood will take place as a directly associated activity (DAA) under the regulations of the Part B permit and not part of the proposed EP. The location of the areas associated with the wood treatment are shown on Drawing Nos. VIE/2704/03 and will be kept separate from areas associated with the main operation on site which is the plastics treatment facility.

5.1.3 Oaktree Environmental attended site on the 21st January 2022 in order to undertake specific measurements of individual items of plant which make up the treatment plant as well as the external noise sources. Table 5.1 and 5.2 overleaf includes the sound pressure levels and distance from the plant along with a corresponding power level.

5.1.4 For measurements taken at the existing yard, electronic noise files, photographs and videos can be provided, if required.

Table 5.1 - Noise levels Associated with External Operations

Activity	Noise Level (LAeq)	Sound Power Level	Source
Forklift loading curtain sided lorry	65.0 at 10m	96.0	Oaktree measurement of similar activity
Tana shredder including loading	93.4 at 2m	110.0	Oaktree measurement of similar activity

Table 5.2 - Noise levels Associated with Internal Operations

Activity	Noise Level. (LAeq)	Sound Power Level	Source
Second sink/float	100.8 at 1m	112	Oaktree measurement of onsite plant
Dehydrator and sink/float separation	104.9 at 1m	116	Oaktree measurement of onsite plant
Bagging unit	97.6 at 2m	114	Oaktree measurement of onsite plant

5.1.5 To assess the potential noise impacts associated with the installation of the recycling facility on the on the nearby noise sensitive receptors, noise models have been created using CadnaA. The software package utilises standardised noise prediction methodologies and algorithms to predict the propagation of noise from source to receiver.

5.1.6 The CadnaA noise model was constructed using OS mapping Opendata and Google Earth satellite imagery.

5.1.7 The following assumptions/parameters are made within the model:

- The intervening land between the site boundary and residential properties was modelled with G = 1.0 as it was considered that the land is predominantly acoustically absorbent.
- Noise sources associated with the internal processing plant are assumed to be constant, as is the external shredder (daytime only inactive during the night-time). However, the loading of lorries via the forklift is assumed to operate for 320 minutes per day (20 minutes per hour) between 07:00-23:00.
- Buildings were set as acoustically reflective, with a reflection loss of 1 dB.
- Noise levels were determined at residential properties representing the nearest residential facades. The height of each receiver was 2.0 m, consistent with the height of a typical first storey window.
- The predicted noise levels were free-field, A-weighted, sound pressure levels. The noise contours generated within the model are also at a height of 2.0 m, assumed to be the worst-case scenario.

- The main treatment building height was modelled at 7m, whilst the internal surface area (walls and ceiling) was assumed to be 2895.5m^2 .
- The roller shutters on the western façade are assumed to be closed during the night time and open during the day time. These are assumed to comprise 100mm thick steel sheeting.
- The value of R (sound reduction index offered by the building) was based upon the cladding which is assumed to be 190mm steel sheeting with solid brick (240mm) to 2.2m and 50mm acrylic glass for the ceiling, commensurate with the existing rooflights.
- Surrounding building heights have been taken from observations and information provided from the Local Authority public access where available
- It should also be noted that concrete block wall is modelled to a height of 4.5m in the west of the yard area. In addition, the containers on the site layout and fire plan are modelled to a height of 2.5m.

5.1.8 Following from the previous revision of this document, receptor heights have been revised from 5.5m to 5.0m. Previously noise levels were greatest for the top 0.5m of the receptors which lead to an overestimation of noise levels considering that this 0.5m area comprised roofing and loft space. From review of the local dwellings, none of the houses benefit from loft conversions and windows on first floors would be considered to be at an approximate height of 4.0m

5.1.9 In addition, the operation of the Tana shredder has been modelled assuming a 50% sphere partition. Considering the location of the plant and height of the noise source/measurement location, this is considered more accurate than the 100% figure (i.e. Q=1) assumed previously.

5.1.10 It should be considered that the model comprises a worst-case scenario assessment due to a result of the precautionary assumptions made. For example, the roof comprises a mixture of steel sheeting and acrylic glass, however the lower R value of the two materials has been utilised.

5.1.11 Figures 5.2 to 5.3 overleaf details the predicted noise levels (in dB A) associated with the proposed operations at the relevant receptors for both the daytime and night-time. Figures 5.2 and 5.3 detail the location of NMPA, the location of Units 9 and 10 and the nearest residential receptors to the site. The white images comprise buildings and other colours show the decibel level of noise emanating from the site.

Figure 5.2 – Noise modelling of noise associated with the site as per the proposed daytime operation

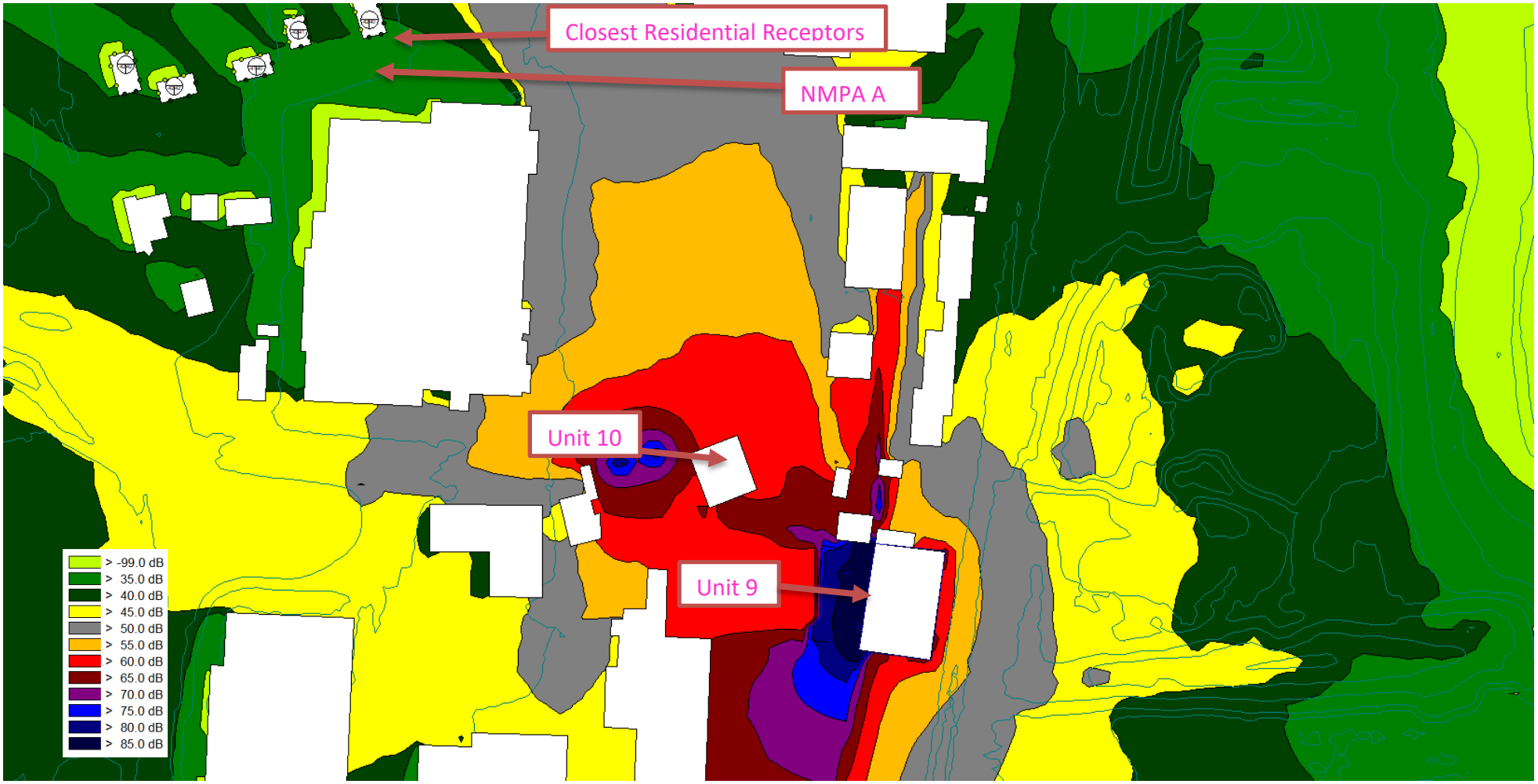


Figure 5.3 – Noise modelling of noise associated with the site as per the proposed night-time operation

5.2 Discussion

5.2.1 With regards to impulsive penalties, the system is generally free from any impulsive crashes or bangs due to the nature of the noise sources. However, there is a tonal element to the plant that may be just perceptible at the nearest dwellings. Therefore, a 4dB penalty has been applied to the assessments below.

Table 5.4 – Preliminary BS4142:2014 assessment with regards to operation between 07:00-23:00

	Calculated noise level at dwellings off Moreton Avenue	**Comments**
Calculated noise level as per figure 5.2-5.3	42	
Addition of relevant penalties as per bs4142:2014	+4 = 46	As per Section 5.2.1
Comparison to background level – 23:00-07:00	38.6 to 40.1 – 46 = 5.9 to 7.4 above background	Potential for an adverse impact as per BS4142:2014, dependent on context.

Table 5.5 – Preliminary BS4142:2014 assessment with regards to operation between 23:00-07:00

	Calculated noise level at dwellings off Moreton Avenue	**Comments**
Calculated noise level as per figure 5.2-5.3	30	
Addition of relevant penalties as per bs4142:2014	+4 = 34	As per Section 5.2.1
Comparison to background level – 23:00-07:00	38.6 to 40.1 – 34 = 4.6 to 6.1 below background	Negligible/low impact as per BS4142:2014

5.2.2 Therefore, the preliminary assessment shows that with regards to the proposed operations during the night time, the rating level is considerably below the measured background level at these times and therefore the impacts associated with noise as a result of the proposed operation of the site at these times are negligible/low. With regards to the daytime operations, the model identifies a potential for an adverse impact from the noise sources, dependent on context. It should of course be noted that the assessment comprises a worst-case scenario, with regards to “on-times” and assumptions made within the model. Discussions with the site management have revealed that PVC strip curtains are to be installed within each roller shutter, whilst the impact of this on noise levels is difficult to

quantify, this should lead to a reduction in noise levels escaping from the building, and a reduction of up to 5dB may not be unexpected. In addition, management will ensure roller shutters are closed if possible, during the daytime.

5.2.4 The above notwithstanding, the rating level during the daytime is marginally above the 5dB threshold at which an adverse impact is considered possible, dependent on context. The recently updated UK noise guidance for permitted sites lists 12no. factors that may impact the context of a noise source, these build upon the guidance within BS4142:2014 and are listed below with an associated comment as to their applicability:

- *Weekdays rather than weekends*

  Waste treatment activities are to be undertaken Monday to Friday with weekend work primarily comprising maintenance and housekeeping which are likely to be considerably more quiet.
- *What the sound 'means' – meaningful sound is one that conveys an unpleasant meaning beyond its mere acoustic content, for example noise from an abattoir*

  Whilst the noise associated with the operation of the site has the capacity to cause annoyance (justifying the inclusion of penalties as per BS4142:2014), the plant carries no particularly unpleasant meaning and is not out of character for the area considering the presence of the surrounding commercial/industrial noise.
- *Time of day*

  As described previously, site operations are 24/7. However, numerous external noise sources (forklifts manoeuvring waste) will not be active outside of daytime hours. With reference to Sections 4.4.1-4.4.3, ambient industrial and road noise was observable during the night-time.
- *The absolute sound level*

  With reference to Tables 4.3-4.5, the rating level is comparable, or below, the existing LAeq noise levels within the vicinity of the residential receptors. In addition, internal and external amenity guidelines as per the WHO and BS8233:2014 are achieved.
- *Where the sound occurs*

The sounds occur within an established industrial area south of the receptors and noise of its nature would not be considered particularly out of character for the area.

- *New industry or new residences*

  The site has been used for commercial activities for in excess of 15 years. A brief review of the history of the area via Google Earth confirms this.

- *Intrinsic links between the source and receptor, for example the source is the resident's place of work*

  There is no established link between the source and the surrounding receptors.

- *Local attitudes*

  No formal assessment of surrounding residents has been undertaken, however due to the nature of the background survey (i.e. attended measurements), numerous conversations took place between the assessor and the local residents. The vast majority of which did not seem to be unreasonably concerned with noise issues as a result of the industrial area to the south.

- *The residual acoustic environment*

  The existing noise climate is discussed at length within Section 3.0, in particular Table 3.6 and 3.7. As detailed previously, the nature of the sounds are not readily distinguishable from those of the surrounding area, with road traffic and industrial noise masking much of the onsite operations.

- *The land use at the receptor (for example, gardens rather than yards)*

  The residential dwellings to the north include external amenity areas which would warrant assessment. Within the Cadna model, a receiver was placed within these areas at a height of 2m in order to model the impact of these areas. The resultant noise level in lieu of tonal/impulsive penalties was 38.3dB (A) during the daytime, this confirms that noise levels are loudest at first story bedrooms and that the impact within external amenity areas is likely to be lower.

- The exceedance (traditional BS 4142)

  This is discussed within Sections 5.2.2-5.2.4 and Tables 5.4-5.5. This is indicative of a potential adverse impact, dependent on context. The EA guidelines consider that the contextual/subjective argument may higher or lower this band (i.e. to low impact or to significant adverse).

5.2.5 Based on; the absolute sound level (which is lower than that of tables 5.4-5.5 within amenity areas), achievement of internal and external noise criteria, existing noise climate, the longstanding presence of industry and nature of the sound. The associated impact during the daytime is considered to remain low.

5.2.6 It can also be considered that a 2dB penalty for tonal operations may be more appropriate during the daytime operations taking into account the contributors to the background level and the existing noise climate. It is unlikely that the tonal element will be particularly observable when compared to the existing scenario at these times.

5.3 BS8233:2014 Internal Operations

5.3.1 It may also be observed that BS4142:2014 gives an indication with regards to external noise levels and is not intended to be applied to the derivation of indoor sound levels arising from external noise sources or the assessment of indoor sound levels. However, it is reasonable to assume that residents would not expect to be utilising external amenity areas between 23:00 and 07:00 and therefore, in some instances it may be more appropriate to assess night time noise levels using the internal criteria within BS8233:2014 in order to give an indication of the likelihood of noise complaints given the context of the other standards.

5.3.2 Whilst BS8233:2014 is not intended for the assessment of noise generating activities, it does serve to give an additional layer indication of the likelihood of noise complaints.

5.3.3 The WHO Guidelines for Community Noise consider that a typical window left open for ventilation provides 15 dB attenuation from external noise sources. The table below calculates a worst-case scenario internal noise level at these properties as a result of the

activities between the hours of 23:00-07:00. Tonal/impulsive penalties have not been applied as these would only be relevant with regards to BS4142:2014.

Table 5.6 – BS8233:2014 assessment with regards internal noise levels

Operation	Predicted façade level	Predicted internal noise level	Guideline limit (daytime bedroom/ living room value)
Calculated noise level at dwellings off Church Road	30	-15 = 15	30

5.3.4 As can be seen from Table 5.4, the internal levels fall in well within those quoted within BS8233:2014. As discussed previously, the noise source is also free from impulsive crashes and bangs which may cause undue disturbance during the evening.

5.4 Uncertainty

5.4.1 Uncertainty in this assessment was controlled via the following precautions/procedures:

- Both the sound level meter and calibrator have a traceable laboratory calibration and the meter was field-calibrated both before and after the measurements.
- Weather during the background sound monitoring was ideal for outdoor noise monitoring (dry, wind speed under 5m/s).
- The measurement locations are considered representative of the existing noise climate outside the nearest residential dwellings to the proposed development given the nature of the existing noise climate. Whilst a greater level of background data would be desirable, it is considered unlikely that it would change the findings of the report.

6 Conclusion

6.1 Summary& Recommendations

6.1.1 Oaktree Environmental have undertaken a noise impact assessment for a site at Units 9 & 10, Vauxhall Industrial Estate, Ruabon, Wrexham LL14 6HA.

6.1.2 The primary receptors are considered to be the residential dwellings to the north, off Moreton Avenue. The New Hall Independent Hospital and adjacent receptors were not considered necessary to include in this report due to the following:

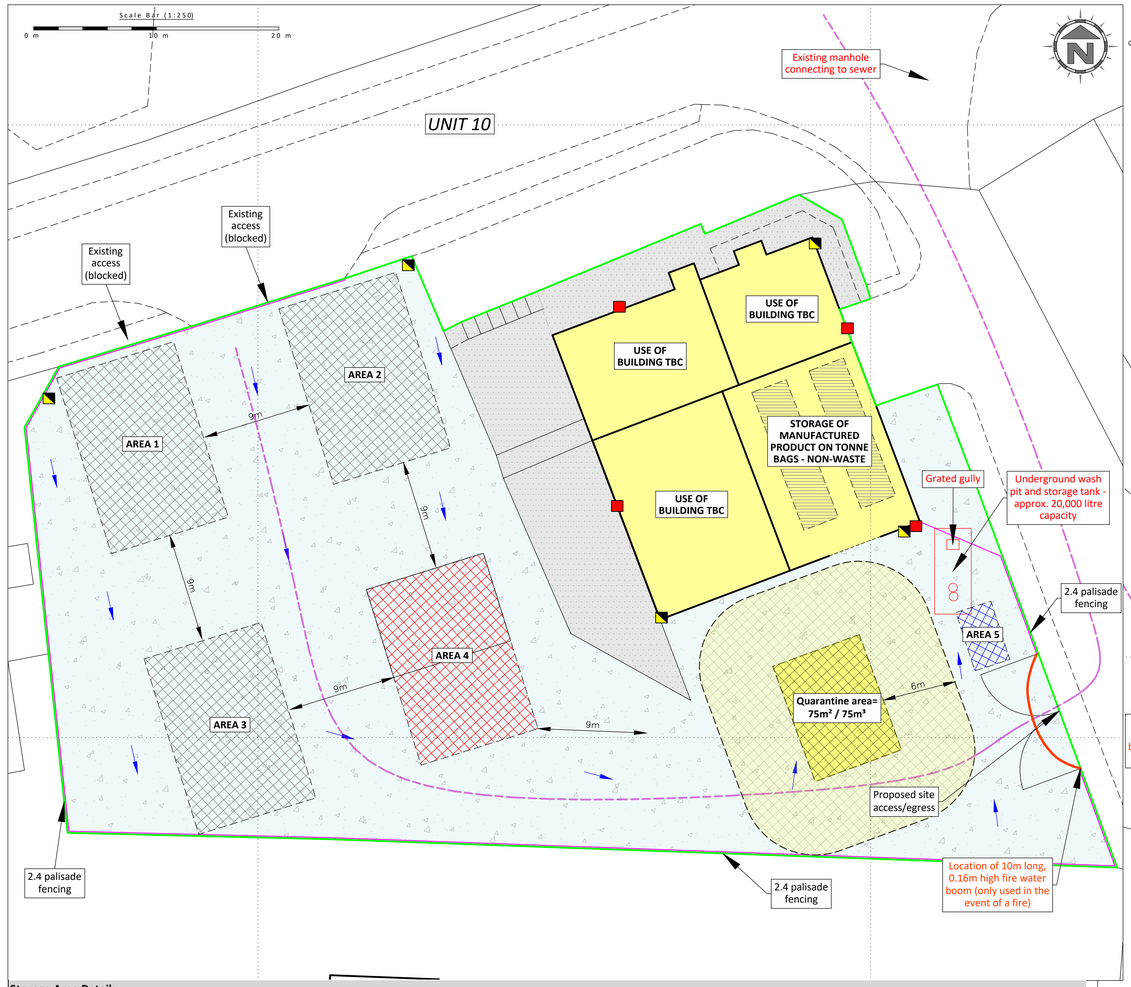
- This/there is/are not the NSRs to the site, the NSR is in the vicinity of where the monitoring was carried out which provides a more robust/worst-case scenario assessment.
- Approximately 150m north of the site comprises the active Enovert Hafod LFG Site, it is considered the background noise levels measured at the hospital would be higher than those measures for the purpose of this NIA. In addition to this, this receptor is also situated 240m to the west of the busy A483 dual carriageway, 245m to the east of the railway line with tall/vegetative cover directly west of the line and the on-site building at Unit 9 would screen most if not all noise arising from the site given all access points on the building are to the west.
- Even when the landfill isn't operating, the above would still result in higher background levels during 'night-time' hours.

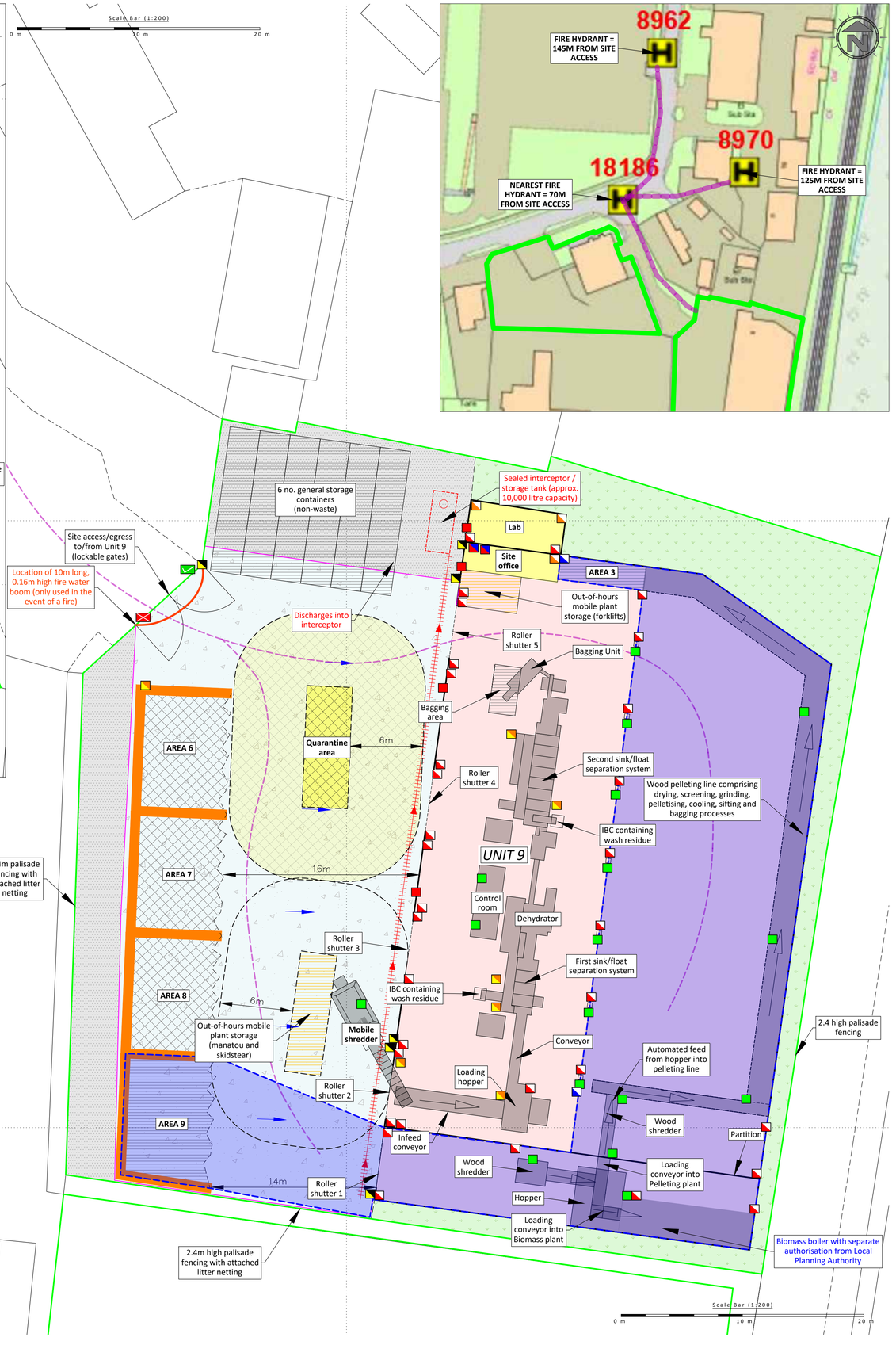
6.1.3 With regards to evenings, the rating level of the proposed operations at the nearest residential receptors are considerably below that of the background levels measured between the hours of 23:00-07:00 and therefore a negligible/low impact is derived as per the guidance within BS4142:2014. In addition, it has been confirmed that the noise levels associated with the operation of the plant will not breach internal criterion as per BS8233:2014.

6.1.4 The BS4142:2014 assessment indicates a potential for an adverse impact due to the exceedance of the rating level over the previously measured daytime background levels, however, BS4142:2014 heavily stresses the need to consider context within assessments, as does NRW guidance and therefore, due to the contextual/subjective reasons discussed, the resultant impact during these times is considered low.

Appendix I

Drawings





Storage Area Details

Plan Ref	Description	Storage type	Containment / type	Height of firewall (m)	Max width (m)	Max length (m)	Max height (m)	Max area (m)	Conversion factor used	Max volume (m3)	Max storage time	Comments
AREAS 1 - 3	Waste acceptance and inspection area for plastic containers	Unprocessed plastic containers /drums / IBC'S	N/A - Freestanding	N/A	15	10	1	150	1	150	<1 week	It must be noted that the containers/drums are likely to be empty so the actual tonnage will be low and the self-combustion risk is extremely low
AREAS 4	Hazardous plastic container storage	Unprocessed plastic containers /drums / IBC'S	N/A - Freestanding	N/A	15	10	1	150	1	150	<1 week	As above - containers deemed hazardous by the site chemist
AREA 5	Containing washing area	As above	As above	N/A	5	3	1	15	1	15	<10 hours	Containers undergo full inspection and washed of any hazardous residues; area clear out-of-hours
AREA 6	Non-hazardous plastic containers	Unprocessed plastic containers/drums	3-sided concrete firewall bay	3.2	10	7.5	2	75	1	150	<1 week	See AREAS 1 - 4 comments
AREA 7	Non-hazardous plastic containers	Unprocessed plastic containers/drums	As above	3.2	10	7.5	2	75	1	150	<12 hours	As above and actual pile size would be much less as waste will constantly be moving
AREA 8	Non-hazardous plastic bales/bags	Mixture of mechanical sorting and processing	As above	3.2	10	7.5	2	75	1	150	<12 hours	N/A
AREA 9	Virgin timber / wood feed for biomass and pelleting plant (non-waste)	Mixture of mechanical sorting and processing	As above	3.2	10	7.5	2	75	1	150	<12 hours	N/A
CONVERSION FACTORS												
Conversion factors for waste piles are worked out using the following methods set out by Natural Resources Wales												
The maximum length & width of pile is based on the largest dimension – the volume of the pile has been calculated using the area x height x relevant conversion factor												
Conversion of 1 for materials stored within containers, area of storage in stackable containers and waste/bale stacks												
Conversion of rectangle + pyramid for waste stored within a bay (approx. 0.75)												
Conversion of pyramid volume for waste stored in a free-standing stockpile (approx. 0.333)												
For areas containing skips, conversion is calculated by volume of each skip x number of skips												

NOTES

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REVISION HISTORY

Rev:	Date:	Init:	Description:
-	02.06.21	CP	Initial drawing
A	09.09.21	CP	Updated layout / client comments
B	11.10.21	CP	Updated layout / client comments
C	21.02.22	CP	Updated layout / NRW comments
D	26.09.22	CP	Updated layout / NRW comments
E	11.11.22	CP	Updated layout / NRW comments
F	15.11.22	CP	Updated layout / NRW comments

Key:

- Permit boundary
- Area covered by Part B Authorisation with LPA and not part of permitted operations
- Combustible waste storage areas
- Combustible waste storage areas (hazardous)
- Product storage non-waste
- Out-of-hours mobile plant storage
- Waste recycling buildings
- Concreted areas
- Other buildings (offices, etc.)
- Stone surface / free draining
- Landscaped/grass areas
- Location of fixed & mobile plant (indicative)
- Interlocking concrete fire walls (minimum 0.6m thick)
- 0.15m high concrete kerbing/seal
- Mains water point
- Spill kit
- Fire fighting equipment (extinguishers, etc.)
- Fire water containment / pollution control equipment i.e. booms, drain mats, drain plugs etc..
- Protective clothing location
- Access routes for emergency vehicles and site plant manouevring areas
- Fire alarm
- Surface water fall direction
- Foul (contaminated) water drainage
- Foul manholes
- Plant shut off
- Fire assembly point
- CCTV cameras (indicative)
- Infrared/heat detection cameras
- Emergency services box

Oaktree Environmental Ltd
Waste, Planning and Environmental Consultants

DRAWING TITLE
SITE LAYOUT & FIRE PLAN

CLIENT
New Horizon Biofuel and Animal Bedding Co Ltd

PROJECT/SITE
Units 9 & 10, Vauxhall Industrial Estate, Ruabon, Wrexham LL14 6HA

SCALE @ A1	CLIENT NO	JOB NO
1:200	2704	012
DRAWING NUMBER	**REV**	**STATUS**
VIE/2704/03	F	Issued
DRAWN BY	**CHECKED**	**DATE**
CP	PT	15.11.22

Lime House, Road Two, Winsford, Cheshire, CW7 3QZ
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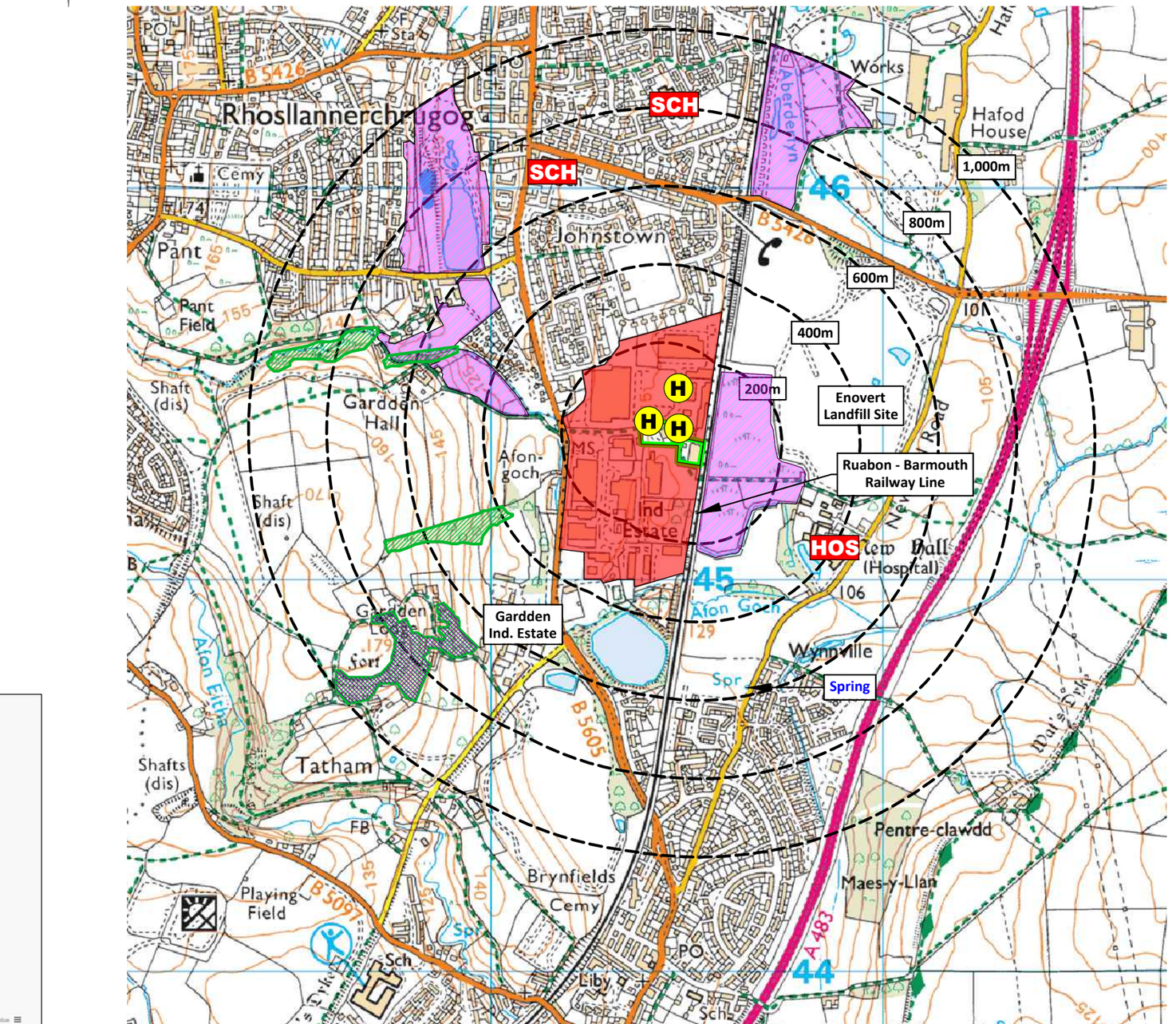
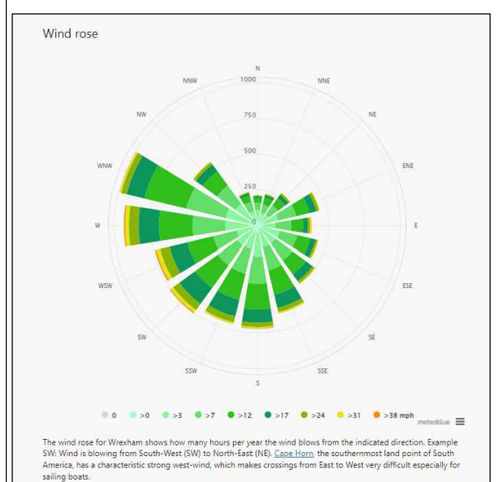
KEY:

- Permit boundary
- Surface water (river / stream / beck)
- Surface water (estuary / pond / pool / lake / sea)
- Vauxhall Industrial Estate
- Workplaces (includes agriculture industry, commerce and retail)
- Residential blocks
- Class A roads
- Class B roads
- Class C roads
- Nearest fire hydrant
- Railway line
- Schools/nurseries
- Hospitals/medical centres
- Woodland areas
- Protected sites - Johnstown Newt Sites SAC & Stryd Las a'r Hafod SSSI
- Gardden Fort Wood (LWS)
- Priority Habitats - Areas of Ancient Semi Natural Woodland and Restored Ancient Woodland sites





Compass Wind Rose for Wrexham
Period 1982 - 2022
source: Meteoblue

Scale Bar (1:12,500)

0 km 500 m 1 km

NOTES

1. Boundaries are shown indicatively.
2. Wind rose data shows the prevailing wind direction from the west/north-west.

REVISION HISTORY

Rev:	Date:	Init:	Description:
-	09.09.21	CP	Initial drawing
A	11.10.21	CP	Updated boundary
B	21.09.22	CP	NRW comments
C	11.11.22	CP	NRW comments
D	15.11.22	CP	NRW comments

Oaktree Environmental Ltd
Waste, Planning and Environmental Consultants

DRAWING TITLE
RECEPTOR PLAN

CLIENT
New Horizon Biofuel and Animal Bedding Co Ltd

PROJECT/SITE
Units 9 & 10, Vauxhall Industrial Estate, Ruabon, Wrexham LL14 6HA

SCALE @ A3	JOB NO	CLIENT NO
1:12,500	012	2704

DRAWING NUMBER	REV	STATUS
VIE/2704/04	D	Issued

DRAWN	CHECKED	DATE
CP	--	15.11.22

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