



Welsh Government

Warren Hall, Broughton, Flintshire

Noise, Air Quality, Lighting & Odour (NALO) Constraints Assessment

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1. Introduction

The Welsh Government have commissioned WYG Environmental Planning and Transport (WYG) to prepare a Noise, Air Quality, Lighting and Odour Constraints Assessment to support the Local Plan feasibility study for Land at Warren Hall, Flintshire.

The document has been written in accordance with Drawing 33 (Revision B). Figure 2 illustrates the latest masterplan document.

1.1 Site Location and Context

The approximate United Kingdom National Grid Reference (NGR) is approximately 332437, 362525. The site is bounded to the north by A5104 (Mold Road) and residential properties at Warren Hall Court. To the east by Lester Lane. To the south and west by Kinnerton Lane.

Reference should be made to Figure 1 for a map of the proposed development site and surrounding area.

2. Existing Reports/Information Referred to

2.1 Documents & Websites Consulted

Noise

- Red Line Boundary Plan;
- Review of Google Maps;
- 'Calculation of Road Traffic Noise' (1998);
- 'Design Manual for Roads and Bridges' (2019);
- BS4142:2014 'Methods for rating and assessing industrial and commercial sound';
- BS8233:2014 'Guidance on sound insulation and noise reduction for buildings';
- World Health Organisation 'Community Guidelines for Noise' (1999);
- Aeronautical Constraints Technical Note – 8th November 2019 updated 29th January 2019; and
- Flintshire County Council Unitary Development Plan 2000-2015 Adopted 28th September 2011.

Websites

- Flintshire County Council, Planning Applications (https://digital.flintshire.gov.uk/FCC_Planning);

Air Quality

Documents

- Red Line Boundary Plan;
- Review of Google Maps;
- North Wales Combined Authority: 2018 Air Quality Progress Report, Wood Environment & Infrastructure Solutions UK Limited, September 2018;
- Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, 2017; and,
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, 2014.

Websites

- Multi-Agency Geographic Information for the Countryside (MAGIC) (<http://magic.defra.gov.uk/>);
- Department for Environment, Food and Rural Affairs (Defra) 2019 background maps (<https://uk-air.defra.gov.uk/aqma/maps>); and,
- Flintshire County Council, Planning Applications (https://digital.flintshire.gov.uk/FCC_Planning).



2.2 Planning Portal Search

Following a search of Flintshire County Council's Planning Portal, an 'Outline - Application (with details of siting and access) for 76,394 square metre business park (Class B1), hotel and associated leisure facilities, roadway, car parking, drainage and landscaping, and off-site roadworks including new slip roads from A55(T)' was submitted in 2004. Planning Permission reference: 038744.

Documents available as part of this submission are not available on the planning portal.

Multiple applications associated with the original submission (planning permission reference: 038744) have been submitted since this date.

It should be noted that the original application was at 'outline' stage and not detailed therefore specific details associated with the proposed business park are not known.

As part of Condition 28 of the above planning application, a Noise and Vibration Assessment was prepared by Atkins (Ref. 5118765 dated 31/3/14) which identified the potential for significant effects with respect to Noise. Additionally, as part of Condition 29 of the above planning, Atkins also produced a Dust Assessment (Ref. 5118765 dated 31/01/14) which identified the potential for effects from the site during the Construction phase and associated mitigation.

Following this review, no site-specific assessments for Air Quality, Lighting or Odour were identified.

3. Overview

3.1 Noise & Vibration

An on-site noise survey would be required to quantify existing ambient average noise levels (L_{Aeq}) and existing background noise levels (L_{A90}) during both the daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods.

Following a review of the site and the surrounding area, there are several significant sources of noise which may present a risk to proposed residential areas. These sources would also contribute to the existing baseline ambient noise climate in the areas.

Identified sources of noise include:

- Road traffic noise from A55 to the north-east of the site;
- Road traffic noise from A5104 to the north of the site;
- Hawarden Airport towards the north-west of the site; and
- Operational noise from North Wales Autograss Club to the east of the site.

3.2 Air Quality

Local Air Quality Management (LAQM)

As required under section 82 of the Environment Act 1995 Flintshire County Council (FCC), as part of the North Wales Combined Authority (NWCA) has conducted an ongoing exercise to review and assess air quality within its area of jurisdiction. The assessments have indicated that concentrations of NO_2 and PM_{10} are below the relevant AQOs at some locations of relevant public exposure within the Council.

The site is not located within an Air Quality Management Area (AQMA). The NWCA has not declared any AQMA's within the authority.

The closest AQMA is located within the jurisdiction of Cheshire West and Chester Council (CWCC).

Air Quality Monitoring

Monitoring of air quality within FCC is undertaken through non-continuous monitoring methods. These have been reviewed in order to provide an indication of existing air quality in the area surrounding the proposed development site.

Non-Continuous Monitoring

FCC, as part of the NWCA, operate a network of 54 non-continuous air quality monitoring locations (diffusion

tubes) whereby results are published on an annual basis. The latest monitoring available is annual mean concentrations for 2017.

Reference should be made to Figure 1 for the locations of the diffusion tubes within the extents of the air quality study area.

The most recently available diffusion tube monitoring data is from 2017, which is presented in Table 1.

Table 3.1 Monitored Annual Mean NO₂ Concentrations

Site ID	Location	Site Type	Distance from Kerb (m)	Inlet Height (m)	2017 Annual Mean NO ₂ Concentration (µg/m ³)
Site 28	Ysgol St John, Penymynydd, CH4 0LG	Industrial	1.0	2.0	18.6
Site 33	133 Main Road, Broughton, CH2 0NR	Kerbside	1.0	2.4	23.8
Site 49	31 The Rowans, Broughton, CH4 0TD	Kerbside	25.0	2.0	16.2

The closest diffusion tube, Site 49 is located approximately 748m north-east of the Proposed Development Site.

As indicated in Table 3.1, no monitoring station exceeded the AQO (40µg/m³ annual mean) in 2017.

Background Concentrations

By reference to the Department for Environment, Food and Rural Affairs (Defra) 2019 background maps, Table 3.2 below details the background concentrations for the Proposed Development Site.

Table 3.2 Published Background Air Quality Levels (µg/m³)

Coordinates (x,y)		2019			
		NO ₂	NO _x	PM ₁₀	PM _{2.5}
331500	362500	7.70	10.04	11.26	7.31
332500	362500	7.42	9.67	10.66	7.00
331500	363500	9.78	12.92	11.82	7.65
332500	363500	9.86	13.04	11.96	7.69

The existing background concentrations, at the Proposed Development Site, based on the Defra background maps is <10 µg/m³ for Nitrogen Dioxide (NO₂) and <12 µg/m³ PM₁₀. Based on the current background at the site at present, there are not predicted to be any significant health issues associated with poor air quality to future residents. This is based upon the Proposed Development Site being allocated for housing.

Sensitive Receptor Locations

Residential Sensitive Receptors

The closest residential sensitive receptors are located adjacent to site boundary. These receptors include:

- Broad Oak Farm, Lesters Lane;
- Crab Mill Farm, Lesters Lane;
- Mount Farm, Lesters Lane;
- The Mount, Lesters Lane;
- Hillside Cottage, Kinnerton Lane;
- Beeston View, Kinnerton Lane;
- 1 Kinnerton Lane;
- Warren Hall Lodge, Mold Road; and,
- The residential dwellings at Warren Hall Court.

Ecologically Sensitive Receptors

Air quality impacts associated with the proposed re-development have the potential to impact on receptors of ecological sensitivity within the vicinity of the site. The Conservation of Habitats and Species Regulations (2017) require competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas).

A study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within the extents of the dispersion modelling assessment. This was completed using the Multi-Agency Geographic Information for the Countryside (MAGIC) web-based interactive mapping service, which draws together information on key environmental schemes and designations. Following a search within a 1km radius of the site boundary, no ecologically sensitive receptors were identified.

Emissions Sources

The site is bounded in all directions by the surrounding road network. The principal traffic derived pollutants likely to impact local receptors are NO₂, PM₁₀ and PM_{2.5}.

With the largest source of emissions associated with the A5104, located adjacent to the northern boundary of the Proposed Development Site. Traffic emissions associated with these roads are predicted to be the greatest source of emissions upon the Proposed Development Site.

Depending on traffic flows associated with the A5104, there is the to affect the developable area of the site.

Additionally, located within 100 metres north-west of the site boundary is Broughton Cottage. There is a low risk for dust emissions from the Grab Hire company on to the proposed development site.



3.3 Lighting

There are no surrounding significant sources of light likely to affect the proposed development.

3.4 Odour

Surrounding the proposed development site there are several farms which have the potential to be odour sources. The following farms have been identified within 200 metres of the site boundary:

- Broad Oak Farm, Lesters Lane;
- Crab Mill Farm, Lesters Lane;
- Mount Farm, Lesters Lane; and,
- Bramley Hall Farm.

Further information and odour surveys would be required to determine the effects of the above potential odour sources on the Proposed Development Site.

4. Site Abnormals

4.1 Noise & Vibration

Construction Phase

Given the likely extent of construction activities, it is considered likely that temporary works may affect nearby existing residents. Standard best practice measures (such as hours of operation, selection of plant etc) should be employed as part of a site-wide Construction and Environment Plan to minimise the effects of construction noise and are subject to Condition 28 of application reference 038744.

A noise and vibration assessment was prepared by Atkins in relation to Condition 28 (Ref. 5118765 dated 31/3/14) which identified the potential for significant effects with respect to noise.

The noise assessment identified a range of best-practice measures to be implemented at the site including a noise and vibration management plan which determined construction noise monitoring limits at surrounding residential properties and use of best practicable means to control site noise to reduce any potential impact from the construction phase of the development.

Operational Phase – Change in Traffic Noise Levels

It is expected that numbers of traffic will increase as a result of the proposed development. A detailed assessment of the noise level change predicted from the change in traffic levels should be undertaken. The noise level change will be based on the change in traffic numbers as predicted in the transport assessment. As a basic calculation a 25% increase in traffic numbers would normally increase noise levels at surrounding existing sensitive receptors by 1dB. Given the extent of the residential area, there is a potential that an increase of 25% may be predicted on smaller roads surrounding the development.

Although the nature of the majority of increased traffic numbers is not expected to vary significantly (i.e. cars belonging to proposed residents), the introduction of commercial vehicles associated with the proposed business park may result in significant increases in road traffic volumes.

A more detailed assessment should be undertaken based on the guidance presented within CRTN:1998 '*Calculation of Road Traffic Noise*' and DMRB Volume 11: 2019 '*Design Manual for Roads and Bridges*' to assess the change in noise levels at existing surrounding sensitive receptors.

Operational Phase – Proposed Business Park Noise Emissions

The design of the potential commercial units will need to take into account noise from commercial vehicle movements, the unloading and loading of goods and the introduction of Building Services Plant (BSP).

The commercial units have the potential to create noise sources from HGV activities including impulsive events from loading and unloading activities.

Noise levels from the proposed commercial units should be assessed in accordance with the guidance presented within BS4142:2014 '*Methods for rating and assessing industrial and commercial sound*'. Given the proximity of the proposed commercial area to existing and proposed residential sensitive receptor locations, it is expected that mitigation will need to be considered in the form of site orientation / acoustic screening. With this mitigation however, there is not predicted to be any potential impact of the development.

Operational Phase – Proposed Residential Areas

Given the proximity of proposed residential areas to significant noise sources, such as; road traffic along the A5104 to the north of the site; the A55 to the north-east of the site, Hawarden Airport to the north-east of the site and North Wales Autograss Club to the east of the site, there is a potential that noise levels in some areas of the residential developments will exceed relevant internal noise guideline levels.

A noise survey will be required to be undertaken to determine existing ambient noise levels and to characterise source noise from the nearby airport and automotive club. Internal noise levels will be assessed within proposed residential dwellings in accordance BS8223:2014 '*Guidance on sound insulation and noise reduction for buildings*' and the World Health Organisation WHO:1999 '*Guidelines for community noise*'.

It is expected that additional mitigation will be required (in the form of site layout and additional acoustic glazing / alternative means of ventilation) in worst-effect areas of the site (i.e. properties adjacent to the A5104 and the hotel located adjacent to the A55). With appropriate mitigation, there is not predicted to be any potential impact on proposed residents.

4.2 Air Quality

Construction Phase

A Construction Dust assessment was prepared by Atkins in relation to Condition 29 which identified the potential for significant effects with respect to dust during construction. The results of the assessment determined that there is a 'high risk' associated with proposed works from dust and PM₁₀ during construction at the closest sensitive receptors.

Without the implementation of appropriate mitigation as detailed with the Institute of Air Quality Management (IAQM) *Guidance on the Assessment from Demolition and Construction* (January 2014). There is the potential risk that construction activities such as demolition, construction, earthworks and trackout.

Following the implementation of the appropriate site-specific mitigation, there is not predicted to be any potential impact of the development.

Operational Phase – Traffic Emissions

Based upon the size of the site, a detailed air quality assessment would be required to determine the effect of vehicle movements upon the existing sensitive receptor locations.

The detailed air quality assessment would also determine the potential exposure of any proposed sensitive receptor location, if the Proposed Development Site was suitable for housing.

Operational Phase – Dust Emissions

The Dromgoole Grab Hire facility located 100m north of the Proposed Development Site boundary at Broughton Cottage has the potential to generate dust emissions. To determine the risk to any potential land use, a dust assessment inclusive of monitoring would be required.

A dust screening assessment has been undertaken to identify any potential risk zones as a result of the dust source to the north of the Proposed Development Site. The results of the screening have identified that a 150m buffer, from the dust source should be implemented.

The dust risk zone is at the northern site boundary and covers a 27m area of the site. Figure 4 identifies the risk zone. Based upon the latest masterplan, no sensitive receptors are proposed to be located here.

It should be noted that receptor sensitivity of the Proposed Development has been assessed using a worst-case option (i.e. highly sensitive residential dwellings). With this in mind, should a lower sensitivity option be considered (i.e. commercial), the results of the assessment may change, reducing the dust risk zone.

4.3 Lighting

There are no significant sources of light surrounding the development. The development is not in a 'Dark Sky Discovery Area' or 'International Dark Sky reserve'.

4.4 Odour

Odour associated with the farms, as identified within Section 3.4 above may affect the Proposed Development. Specifically, if residential dwellings are proposed.

An odour screening assessment has been undertaken to identify any potential risk zones as a result of the odour sources. The results of the screening have identified three odour risk zones, surrounding the farm buildings.

Based upon the indicative plan provided, no sensitive receptors are proposed to be located in the odour risk zone on the south-west boundary (as a result of odour from Bramley Hall Farm) or at the north-east boundary (as a result of odour from Broadoak Farm). However, a maximum buffer of ~175m from Crab Mill Farm and



Mount Farm may be required, as a result of the odour emissions. Figure 5 identifies these odour risk zones.

It should be noted that receptor sensitivity of the Proposed Development has been assessed using a worst-case option (i.e. highly sensitive residential dwellings). With this in mind, should a lower sensitivity option be considered (i.e. commercial), the results of the assessment may change, reducing the odour risk zone.

To identify the specific extent of the odour source associated with the farm buildings, olfactory monitoring should be undertaken. The results of the survey and assessment may identify parts of the site that are undevelopable or where private amenity gardens will not be appropriate due to the risk of exposure to odour.

Mitigation would be recommended to reduce and/or prevent exposure of odour sources at the sensitive receptors as appropriate. Mitigation could include:

- An offset from the odour source where no residential properties would be built; or
- Establishment of a Vegetative Environmental Barrier (VEB) during the detailed design stage.

It should be noted that the extent of the odour zone would be determined through an on-site olfactory odour survey.

5. Masterplan Constraints

5.1 Noise & Vibration

Operational Phase – Proposed Business Park Noise Emissions

The units should be designed to ensure that any service yard / unloading areas are orientated away from existing sensitive receptors. Service yard / unloading areas should be screened using the commercial unit themselves where possible. If this is not possible in all areas, then there should be the provision for the implementation of acoustic barriers between service yard areas and sensitive receptor locations.

There may also be provision to restrict the operational and delivery hours of the proposed commercial units to avoid operations during the more sensitive night-time (23:00 – 07:00). However, it is understood this is occupier dependent.

Noise from building services plant is understood to be controlled through design. The location and choice of plant should control any potential adverse impact on surrounding sensitive receptors.

Operational Phase - Proposed Residential Areas

A 20 - 30m risk area should be located between the A5104 and any proposed residential dwellings, within which residential properties would require detailed acoustic design. All external garden amenity areas should be located towards the centre of the site to allow for the dwelling themselves to screen against road traffic noise and the proposed commercial units. Amenity areas in all areas of the development should have 1.8m close-board fences around the perimeter.

Figure 3 identifies a 30m risk zone. Based upon the latest masterplan, no sensitive receptors are proposed to be located here.

Where possible sensitive spaces such as living rooms and bedrooms should be positioned away from noise sources (such as the A5104, proposed commercial units and the 'North Wales Autograss Club'). However, where this is not possible, for worst-effect facades (i.e. those adjacent to the A5104, proposed commercial units or automotive club) may required additional mitigation from enhanced acoustic glazing. The presence of the airport to the north-east of the site, and with the reference to the Aeronautical Constraints within the WYG technical note (dated 8th November 2018 updated 29th January 2019), the site is understood to be directly below the flight path of planes taking-off and landing. Therefore, it is expected that sensitive spaces in the majority of areas in proposed residential dwellings will require an alternative means of ventilation (i.e. trickle vents) as openable windows could not be relied upon for ventilation purposes during noisier aircraft events.

5.2 Air Quality

Traffic Emissions

Based upon the monitored concentration at monitoring location 28 (located adjacent to A5104) being significantly below the Air Quality Objective (AQO) for NO₂, no air quality buffer would be required.

Given that the road network surrounding the Proposed Development Site are minor, air quality emissions from these roads would not exceed the AQO at surrounding receptors.

With the above in mind, no air quality buffers would be required at the Proposed Development associated with road traffic emissions.

Dust Emissions

Figure 4 identifies the risk zones where dust emissions associated with the operations of the Grab Hire company to the north of the Proposed Development could potentially result in emissions on to the proposed site. A very small part of the area at the north of the site may be subject to dust emissions. This would be confirmed through dust monitoring or could be mitigated by placing non-sensitive uses here.

5.3 Lighting

The development is classed as being in ILP Environmental Zone E2, representative of relatively dark outer suburban locations. Any lighting associated with the development should be designed carefully so as to minimise light spill where it is not required, e.g. on to hedge rows which may affect ecological corridors.

Upwards light spill will be controlled by appropriate product selection.

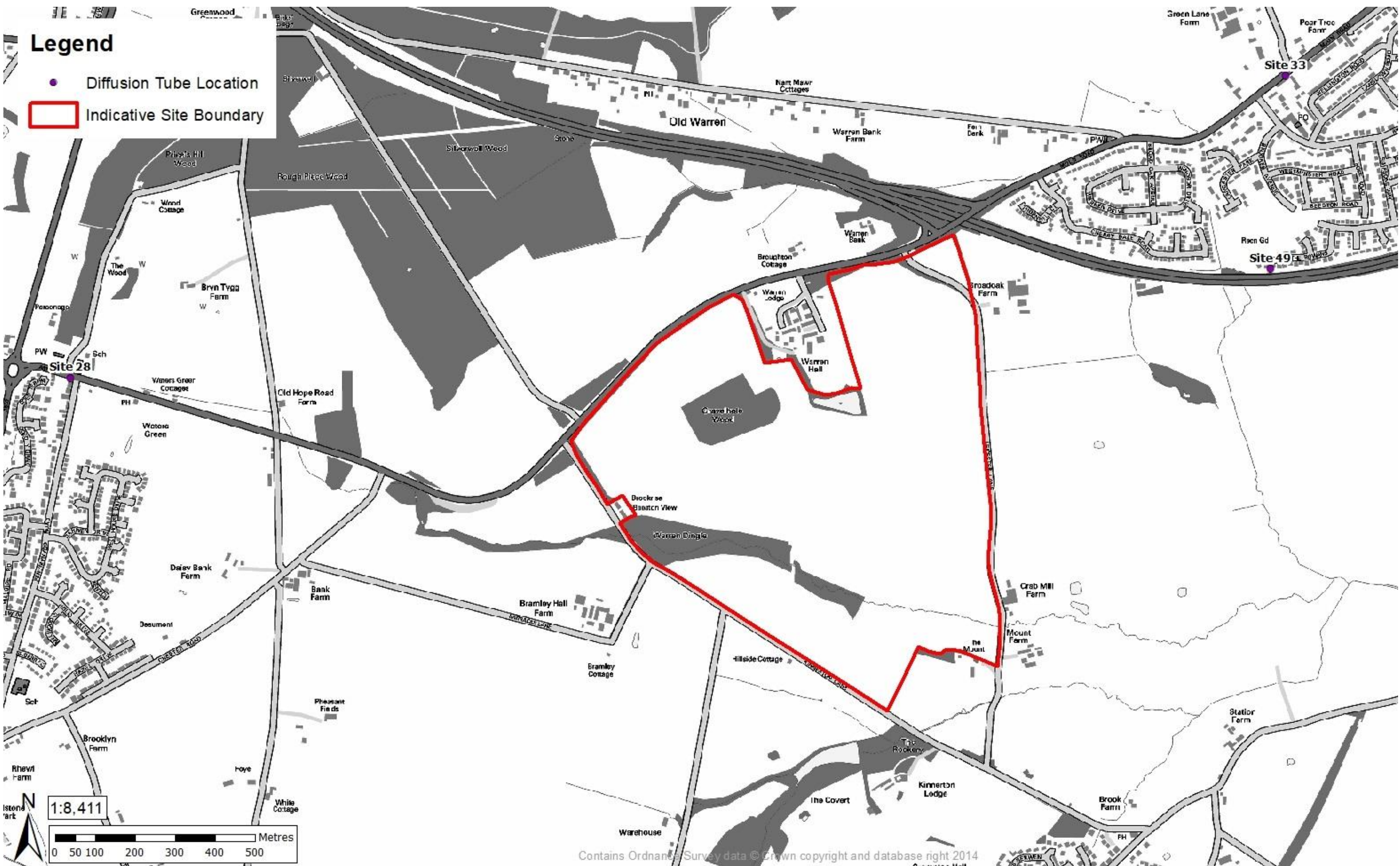
5.4 Odour

Figure 5 identifies the risk zones where odour emissions associated with the operational farms could potentially be an issue. These areas, specifically the zone surrounding Crab Mill Farm and Mount Farm (where sensitive receptors are proposed), are where residents have the potential to be exposed to high odour concentrations. This would be determined through understanding of operations at the farm and more detailed survey work. Following the survey work, any mitigation required would be able to be determined.



Figures

Figure 1 Site Location



This is a detailed landscape architectural site plan for a development. The plan shows a large area outlined in red, containing several green spaces and purple rectangular areas. A central road with a double-headed arrow runs through the site. Surrounding areas include 'Rough Piece Wood' to the west, 'Gravelly Wood' in the center, and 'The Bockery' to the south. Various buildings and infrastructure are labeled, including 'Warren Hall', 'Bramble Hall Farm', and 'The Bockery'. The plan includes topographical features like 'Gravelly Wood' and 'The Bockery'.



Figure 3 Noise Risk Zones



Figure 4 Dust Risk Zones



Figure 5 Odour Risk Zones





Appendix A Report Terms & Conditions

This Report has been prepared using reasonable skill and care for the sole benefit of The Welsh Government ("the Client") for the proposed uses stated in the report by [WYG Environment Planning Transport Limited] ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

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The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

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