# Worcestershire Regulatory Services

# Technical Guidance Note for Planning

**January 2021**

**V5.2**

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| **Checked By** | |
| **Changes** | Updates to:<br>- Contaminated Land sections – replace references to CLR11 with LCRM guidance<br>- Ground gas protection measures verification section added<br>- Document structure and formatting changes |
| **Notes** | Section 5 (Noise & Vibration) is due for review and update April 2021. |

## Contents

## 1. Introduction

This technical guidance document sets out in detail, Worcestershire Regulatory Services approach to dealing with environmental protection matters when consulted by local planning authorities (LPA) focusing on the areas of:

- Contaminated Land
- Air Quality
- Light Pollution
- Noise and Vibration
- Odour

It identifies associated impacts that could affect public health and wellbeing. The planning system is very complex. It can also be very emotive and can affect individuals and communities in different ways. The objective of this document is to help applicants and developers through the planning process and to ensure that the most important aspects of environmental protection are addressed at the most appropriate stage of the planning process.

The document is set out in 3 parts:

- A "Toolkit" which sets out when additional information may be needed to support a planning application in each topic area.

- Guidance on the application of national and regional planning policy on each environmental impact topic
- Application of relevant technical standards used when considering technical reports and the standards of reporting expected by applicants and their representatives. Some detail is also provided on standard advice that is provided to Worcestershire local authorities and an indication as to the planning advice that may be recommended for inclusion on any planning permission granted e.g. post completion conditions and requirements.

This document is written to serve as an informative and a helpful source of advice. Readers must note that legislation, technical guidance and practical methods of assessment may be subject to change and applicants are encouraged to regularly visit WRS website for any updates. WRS has taken all reasonable precautions to ensure the information in these documents is correct. However, WRS will not accept any liability for loss or damage caused by any person relying on this

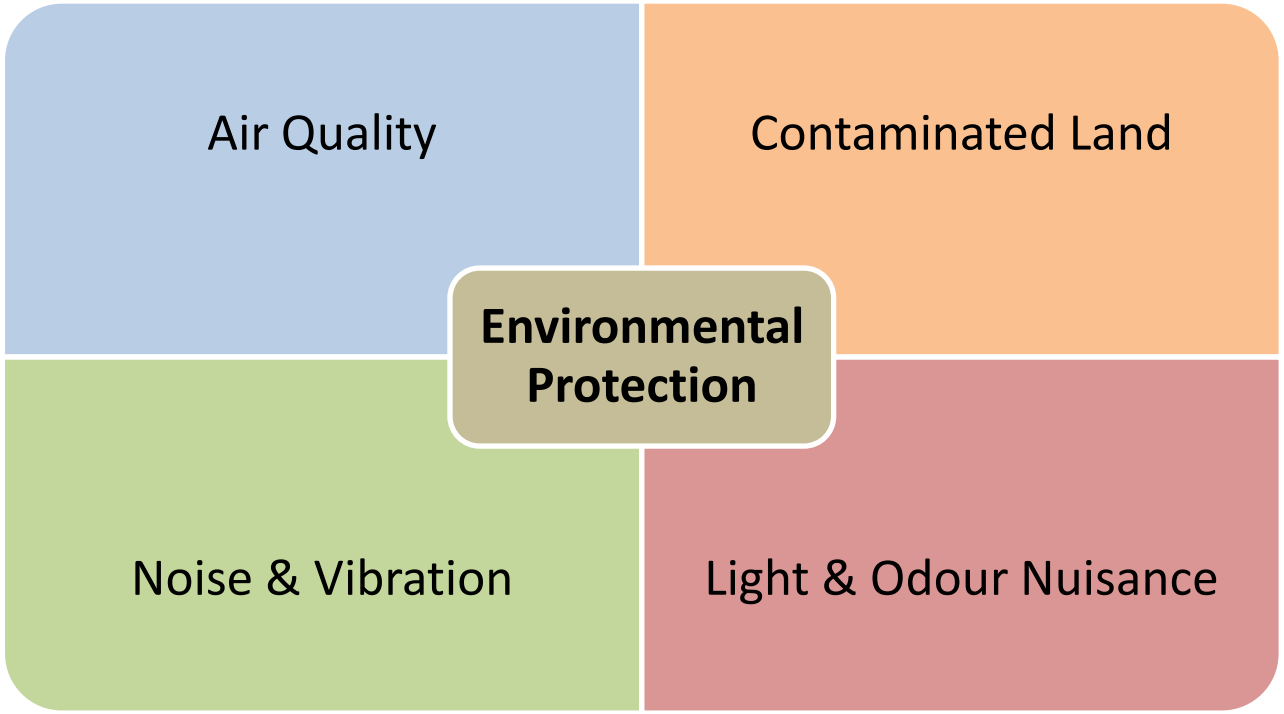
information, or for any errors or omissions in the information provided. WRS may review the contents of this document periodically to take account of any guidance or legislative changes.[1]

[1] *Worcestershire Regulatory Services (WRS) provide all LPA's with environmental impact advice on all planning matters in Worcestershire.*

## 2. Toolkit

For a planning application to stand the greatest chance of success it is important to work through all of the potential environmental issues which may raise concern during its journey through the development control process of each local authority. The tool kit aims to identify whether such concerns are likely to occur and what steps the applicant/developer needs to take to address the issues identified by the toolkit. Once these issues are identified the applicant will be directed to the relevant technical chapters which provide specific detail on investigations and reporting. As in all situations there may be exceptions where the planning officer may refer applications to WRS on a precautionary basis where criteria in the tool kit are not met.

This Toolkit is split into four sections relating to Environmental Protection, these are Air Quality, Contaminated Land, Noise and Vibration and Light and Odour.



## 2.1 Considerations for Air Quality

**Is the development located in a sensitive area?**

For example, within, next to or within close proximity of an existing air quality management area (AQMA) or that could significantly impact upon air quality in areas where objectives are currently not exceeded in such a way to cause exceedance of national objectives.

**Does the new development include car parking?**

≥10 spaces inside an AQMA or ≥100 spaces outside an AQMA.

**Does the new development introduce new exposure?**

Introducing new or additional receptors, e.g. residential housing to an area close to or within an existing AQMA or existing sources of air pollutants.

**Will the new development have an impact on traffic?**

For example, result in significant changes in traffic volumes, increase in congestion or significantly change composition.

**Will the development include?**

Biomass Boilers, Combined Heat and Power (CHP) plants, Short Term Operating Reserves (STOR) electricity generation systems, major road infrastructure changes

## 2.2 Considerations for Contaminated Land

**Is a new development on or adjacent to 'potentially contaminated land'?**
Proposals for any new development located on land that is potentially affected by contamination due to its previous use. A wide range of industrial uses may have historically caused land contamination such as metal works, landfill sites gas works etc. At the same time less obvious land uses such as agricultural land, garages, allotments, electrical substations and filled in quarries can also lead to potential contamination

**Significant importation of material on land?**
Developments that involve importation of material, such as creating bunds may require evidence to prove the suitability of the imported material.

## 2.3 Considerations for Noise and Vibration

**Is a new development classed as a noise-sensitive land use?**
Proposals for any development, whether it is singular or multiple, that involves a residential dwelling including hospitals, schools and nurseries are considered to be the most sensitive to the effects of noise close to road, rail and industrial sources of noise.

**If a new development is to introduce noise or vibration to an existing land use**
Proposals for any development that is likely to emit noise or vibration during their construction or operation. Examples of such development include warehousing, leisure centres, general industry particularly those that involve external plant, waste management operations, minerals extraction and unsocial hours of operation.

## 2.4 Consideration for Light Nuisance

**Does the new development include illuminated signage?**
Proposals for any developments which include signs or advertisements that are illuminated internally or externally and could cause light nuisance. Examples are shop/retail facias or billboard advertising.

**Is the new development located adjacent to a significant light source?**
Proposals for any development considered to be a sensitive end use such as residential properties hospitals hotels or hostels.

**Does the new development include a lighting scheme?**
Proposals for any new developments, which include external lighting installations, such as flood or security lighting. Typical examples would include car parks, warehousing, sports facilities such as golf courses, pitches or courts.

## 2.5 Consideration for Odour Nuisance

**Is a new development classed as an agricultural or industrial use?**
Proposals for any development that is likely to emit odours that may be considered offensive to members of the public i.e. Intensive farming, waste management activities, permitted process etc.

**If a new development is a food establishment?**
Proposals for any development that is likely to emit odours from the processing and cooking of foodstuffs i.e. fast food establishments, restaurants, pubs, commercial kitchens etc.

# 3. Air Quality Technical Guidance

## 3.1 Introduction

### 3.1.1 Introduction

This chapter within the technical guidance note (TGO) sets out the requirements for reducing the impact of air pollution from all development within the Worcestershire Districts where Worcestershire Regulatory Services (WRS) provide technical consultation on air quality. The document also provides a specification on technical standards expected for air quality assessments submitted by consultants and prospective developers.

### 1.1.2 Health

Poor air quality is linked to a number of health-related issues. Long term exposure to air pollution impairs lung function growth in children. There is strong evidence that outdoor exposure to air pollution is linked to lung cancer in adults and is associated with new-onset asthma across the age groups. Emerging evidence also suggests there is a link between exposure to air pollution and accelerated decline in lung function during ageing, new-onset type 2 diabetes in adults and that air pollution affects both the developing and ageing brain and worsens existing cardiovascular (heart and blood vessels) disease.
In September 2015, the Department of the Environment, Food and Rural Affairs DEFRA estimated that the combined pollutants of PM2.5 and NO2 contributed towards an increase of between 44,750 and 52,500 deaths each year based on initial Committee on the Medical Effects of Air Pollutants COMEAP findings. Emerging evidence suggests that this may be slightly lower, at around 40,000 deaths per annum (+ or – 25%) The cost to the economy is estimated to be around £22.6 billion per year.

It is a widely held view that new developments have the potential to adversely impact air quality, usually as a result of increased road traffic emissions, or to introduce new exposure to existing poor air quality. Placing the above into the context of development control it is evident that the planning process plays a vital role in short and long term management of local air quality. Hence the importance of considering air quality at an early stage in the application process

### 1.1.3 Objectives

The objectives of this TGO on air quality are:

- to ensure consistency in the approach when dealing with air quality concerns as part of planning;

- to emphasise the importance of air quality as a material planning consideration;
- to outline the circumstances under which air quality assessments will be required;
- to outline the technical assessment requirements and expected by WRS where air quality assessment and subsequent mitigation options appraisal are required;
- to outline the standard air quality mitigation measures recommended by WRS in most residential and commercial development schemes (e.g. electric vehicle charging points, low NOx boilers etc.), and the circumstances under which these recommendations are made;
- to outline where mitigation strategies are required to negate potentially harmful impacts of development and to encourage air quality neutral development; and to provide guidance on the use of planning conditions and Section 106 obligations to improve air quality.

## 3.2 Policy Context

### 3.2.1 Policy Context

The National Planning Policy Framework (NPPF 2018) sets out the Governments planning policies and how they are expected to be applied. The purpose of the planning system is to contribute to the achievement of sustainable development through three key roles: economic; social; and environmental. In terms of the environmental role of the planning system the NPPF considers this to be:

*"An environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."* (Paragraph 8)

*"Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making."* (Paragraph 103)

*Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. Therefore, developments should be located and designed where practical to*

- *accommodate the efficient delivery of goods and supplies;*
- *give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;*
- *create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;*

- *incorporate facilities for charging plug-in and other ultra-low emission vehicles; and*
- *address the needs of people with disabilities and reduced mobility in relation to all modes of transport*; (Paragraph 110)

*"Planning policies and decisions should contribute to and enhance the natural and local environment by:*

- *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils;*
- *recognising the intrinsic character and beauty of the countryside;*
- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *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; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."* (Paragraph 170)

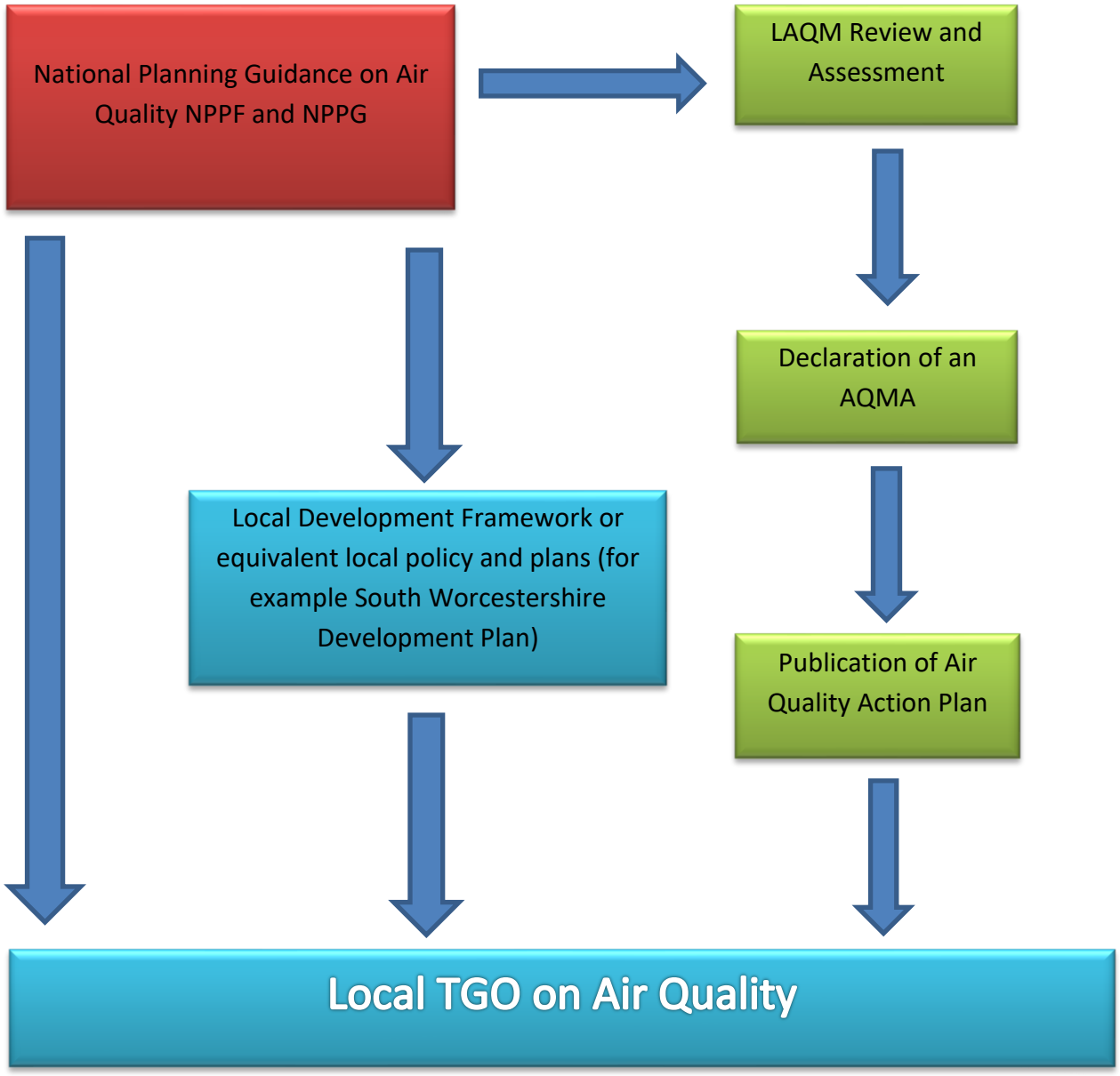
*"Plans should allocate land with the least environmental or amenity value, where consistent with other policies in this Framework."* (Paragraph 171)

*"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 180)

*"Planning policies 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. 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 181)

The role of this TGO and its relationship to the national, regional and local policy and guidance affecting air quality in the Worcestershire District's, as well as its relationship to the Worcestershire Air Quality Action Plan (AQAP), is displayed in Figure 1 below.

**Figure 1 The role of this TGO and its relationship to national, regional and local policy and guidance, and the Worcestershire Air Quality Action Plan**



### 3.2.2 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) in England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objective pollutant concentrations in units of micrograms per cubic metre µg/m3 (milligrams per cubic metre, mg/m3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

**Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England**

| Pollutant | Air Quality Objective Concentration | Air Quality Objective Measured as |
|---|---|---|
| **Benzene** | 16.25 µg/$m^3$ | Running annual mean |
| | 5.00 µg/$m^3$ | Annual mean |
| **1,3-Butadiene** | 2.25 µg/$m^3$ | Running annual mean |
| **Carbon monoxide** | 10 mg/$m^3$ | Running 8-hour mean |
| **Lead** | 0.50 µg/$m^3$ | Annual mean |
| | 0.25 µg/$m^3$ | Annual mean |
| **Nitrogen dioxide** | 200 µg/$m^3$ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg/$m^3$ | Annual mean |
| **Particulate Matter** | 50 µg/$m^3$, not to be exceeded more than | 24-hour mean |

| Pollutant | Air Quality Objective Concentration | Air Quality Objective Measured as |
|---|---|---|
| **($PM_{10}$) (gravimetric)** | 35 times a year | |
| | 40 µg/$m^3$ | Annual mean |
| **Sulphur dioxide** | 350 µg/$m^3$, not to be exceeded more than 24 times a year | 1-hour mean |
| | 125 µg/$m^3$, not to be exceeded more than 3 times a year | 24-hour mean |
| | 266 µg/$m^3$, not to be exceeded more than 35 times a year | 15-minute mean |

Where exceedences of the national objectives are identified in areas of relevant exposure Local Authorities (LAs) are required to declare an Air Quality Management Area (AQMA). When an AQMA is declared the LA is then required to produce an air quality action plan identifying possible measures that would improve air quality in that area in a bid to meet the national objectives.

## 3.3 The Air Quality Situation in Worcestershire

### 3.3.1 The Air Quality Situation in Worcestershire

Details of Air Quality Management Areas (AQMAs) declared within the Bromsgrove, Worcester City, Wychavon and Wyre Forest Districts can be found on the WRS website:- http://www.worcsregservices.gov.uk/pollution/air-quality/air-quality-management-areas.aspx. No AQMAs have been declared within Malvern Hills District Council and Redditch Borough Council areas to date.

In addition to the AQMAs already declared there are other areas of concern throughout Worcestershire where national objectives are suspected of being exceeded or near to the threshold values.

All of the AQMAs declared above relate to elevated levels of nitrogen dioxide linked to road traffic emissions. In 2012/2013 WRS published the Air Quality Action Plan for Worcestershire which provided a review of the conditions at each AQMA and a comprehensive list of actions with the potential to improve air quality Actions were divided into AQMA specific and generic actions. A detailed cost-benefit analysis was then undertaken identifying a series of prioritised actions for each AQMA. Several updates to the action plan have been produced by WRS since publication of the document.

WRS expect that any mitigation measures proposed for a development should work alongside the Air Quality Action Plan for Worcestershire as detailed in the NPPF paragraph 181.

More information relating to Local Air Quality Management within the Worcestershire Districts, including the latest review and assessment reports for DEFRA, monitoring results and action planning, can be found on the WRS website:-
http://www.worcsregservices.gov.uk/pollution/air-quality.aspx

### 3.3.2 Air Quality and Planning

New developments can have an adverse influence on existing areas of poor air quality. Likewise large developments in areas of acceptable air quality can create deterioration that is unacceptable in air quality terms.

It is therefore important that the impact of any development on air quality is fully understood. This requires appropriate assessment and mitigation options appraisal. Where possible all development should have a neutral air quality impact.

The primary sources of air pollution in the UK are road traffic, power generation including domestic and commercial heating sources. All development will include one or both of these sources.

It is recognised that pollution impacts associated with traffic generated by new developments is not restricted to the area of development. Even developments in areas of good air could lead to additional journeying through or to areas of poor air quality. Similarly air pollutants generated by domestic and commercial heating plant e.g. gas boilers are not confined to the development and will add to existing background levels across the County. This guidance document and the standard recommendations for mitigation measures recognise the impact of cumulative development.

Where development is proposed in areas of poor air quality or where there are potential significant impacts on air quality from the development an appropriate air quality assessment will be required. An assessment must take into account the potential cumulative impacts from committed development in the local area as well as the actual development itself, and consider impacts on areas of poor air quality in the locality, such as any AQMAs.

Where an air quality assessment, that is acceptable to the Local Authority, indicates that a development will cause a significant detrimental impact or result in exposure to pollutant concentrations that exceed the national objective, adequate and satisfactory mitigation measures should be secured before the granting of planning permission. In addition general mitigation measures (such as Electrical Vehicle Charging Points, Low Emission Boilers, Secure Cycle Parking) should be applied to all new development to help offset the incremental creep in pollutant emissions.

### 3.3.3 Minimising Air Quality Impacts through Good Design

The design and layout of development to increase separation distances from sources of air pollution and human receptors can reduce the pollution exposure of building occupants. This is particularly relevant where developments include sensitive uses such as hospitals, schools, nurseries, care facilities and children's playgrounds. New residential and other sensitive developments should be located in areas where air quality objectives are being met.

The impact of air pollution on new developments should be taken into account at the earliest stages of building design. Consideration should be given to location of buildings away from sources of pollution such as busy roads. The creation of new street canyons should be avoided with the placement of buildings away from the roadside. Ventilation inlets and the location of opening windows should be on higher floors away from air pollution at ground level where applicable.

The location of outside space is also an important consideration and any exposure of gardens and roof terraces should be screened and minimised through appropriate positioning and orientation.

The National Institute for Health Care Excellence (NICE) published a guidance document in June 2017 entitled 'Air pollution: outdoor air quality and health' which includes the following recommendations:-

- Local Plans should take Air Quality into consideration
- New buildings should be sited in areas where there would be no need for motorised transport
- Buildings to be located away from roads
- Avoid creation of street canyons
- Provide infrastructure to support low and zero emission travel
- Travel Plans to be included in development designs

## 3.4 When is an Air Quality Assessment required?

### 3.4.1 When is an Air Quality Assessment (AQA) required?

Air quality needs to be considered where development is proposed in or near to an AQMA or areas of emerging poor air quality. Air quality must also be considered where development is proposed outside of Air Quality Management Areas (AQMAs) and areas of poor air quality if the proposed development is likely to result in an increase in emissions arising from road traffic and/or relevant point sources.

Given the wide variety of possible developments and site specific conditions dependant on location it is not possible to provide a prescriptive criteria as to when an air quality assessment will be required. Each development is unique and conditions will be site specific. Developers and consultants are advised to liaise with the planning authority at pre-application stage to determine whether or not an assessment is needed. Professional judgement is required to determine whether an assessment is necessary.

Below is a table showing types of development where an air quality assessment may be appropriate.

| Classification | Examples of Development |
|---|---|
| Agricultural Development | Large poultry farm,<br>Large pig farm,<br>Other large intensive agricultural processes. |

| | |
|---|---|
| Commercial Development | Any development likely to significantly increase vehicle traffic, for example:-<br><br>Supermarket or convenience store,<br>Drive through restaurant<br>Leisure centre. |
| Major Infrastructure | Motorways (including modifications),<br>Trunk roads (including modifications),<br>Aircraft / airports,<br>Energy generation<br>Railways,<br>Changes to road junction or road layout within an AQMA or other area of poor air quality. |
| Public Services | Waste management,<br>Mineral extraction and quarrying,<br>Energy generation from waste,<br>Peak power generator plants (STOR systems),<br>Biomass boilers and other large heating / combustion plants,<br>Other substantial combustion process where there are relevant receptors. |
| Residential Development | 100 dwellings or more outside of existing AQMAs or other areas of poor air quality.<br><br>It is likely that smaller developments will require an air quality assessment within an AQMA or other area of poor air quality (indicative criteria of 10 dwellings or more). |
| Retail, Leisure, Commercial, Industrial Development | Developments with 100 parking spaces or more outside of existing AQMA or area of poor air quality. |

| | |
|---|---|
| | Smaller developments will require an air quality assessment within an AQMA or area of poor air quality (indicative criteria of 10 spaces or more). |
| Large Vehicular Depots | Bus station,<br>Lorry park,<br>Park and ride,<br>Business receiving large number of HGVs. |
| Any New Buildings | Introducing new exposure within an AQMA or potential areas of poor air quality |
| Change of Use | Existing buildings and outside space in areas of poor air quality or existing AQMA changed to become:-<br><br>Amenity space<br>Nursery play areas<br>Playgrounds<br>Outside seating areas<br>Residential dwelling or other sensitive use |
| Miscellaneous | Underground car park with extraction system.<br><br>Any new development which substantially increases vehicle traffic or emissions outside of AQMA or area of poor air quality.<br><br>Any new development which increase vehicle traffic or emissions within an AQMA or existing area of poor air quality.<br><br>Any development where new receptors are introduced to existing AQMAs or other areas of poor air quality. |

Please note that the above examples are indicative criteria only as to when an air quality assessment may be required and is not an exhaustive list.

## 3.5 Air Quality Assessments - what should they contain?

### 3.5.1 Air Quality Assessments – what should they contain?

The purpose of any air quality assessment is to quantify changes in pollutant concentrations and potential for exposure to poor air quality at relevant receptors resulting from the proposed development, and in turn the significance of impacts. Impacts must be assessed in the context of relevant national and international objectives and targets, together with any local planning or other policies or guidance where appropriate.

An assessment must take into account the individual and cumulative air quality impacts of committed developments and schemes (i.e. including proposals and schemes that have been granted planning permission at the time the assessment is undertaken). This ensures that 'with development' and 'without development' scenarios are represented as accurately as possible.

A suitable assessment is likely to require a detailed air quality modelling study. On occasion specific pollutant monitoring may also be necessary to inform the model and improve confidence in predictions.

Before undertaking an air quality assessment, every effort should be made to obtain agreement between the Local Authority, WRS and the applicant on the appropriate scope of the assessment and the datasets and methodologies to be used.

### 3.5.2 Overview of the proposed development

A description of the proposed development containing information relevant to the air quality assessment should be provided. Maps detailing site location and proposed site layout plans should be included. Any potential on-site sources of pollution should be identified and any particularly sensitive areas (such as any AQMA) or sensitive receptor (school, nursing home) highlighted.

- Include National Grid Reference (NGR) coordinates and a location plan and site layout plans of the proposed development
- A detailed description of the operational activities and periods, if appropriate, should be provided.
- Detail of the location of the development and the surrounding area, including topography, with consideration for existing areas of poor air quality and sensitive receptors.
- Anticipated trip generation from a development and/or changes in emissions from the site for specified year (for example opening year or the year the project is to be completed)

### 3.5.3 Dispersion Modelling

Where an air quality assessment is required WRS recommend undertaking detailed dispersion modelling utilising a recognised UK appropriate model, such as ADMS Roads. A rationale for the choice of model used should be provided as part of any submitted report and/or assessment methodology proposal.

**Note:** A screening tool such as DMRB is not considered sufficient where an air quality assessment is required and WRS may reject any assessments utilising a screening tool in place of a detailed dispersion model.

### 3.5.4 Model Input Data

- Include: Include National Grid Reference (NGR) coordinates of receptor points and show on a diagrammatic plan.
- Provide details (including NGR coordinates) of any background, local authority or other monitoring data utilised to determine baseline conditions.
- Details of the meteorological dataset used in the assessment must be provided and include a diagrammatic representation e.g. a wind rose diagram. A >90% complete dataset should be utilised within the model.
- Traffic data used in the model must include:
  - Projected trip rates associated with the development
  - The frequency and route of trips
  - Relevant current and projected AADTs – if these have been extrapolated from 12 hour or peak hour counts details of how AADTs have been calculated should be provided. **The application of a local authority expansion factor may be required, WRS recommend discussing the suitability of the dataset with Worcestershire County Council Highways department prior to carrying out detailed dispersion modelling for air quality assessment purposes.**

- Details relating to the speed data used in the model should be provided including details of the source of the data. The accuracy and suitability of the data and the requirement for adjustment within the model should be considered.
- The combined impact of vehicles and energy sources from the proposed development should be assessed.
- The cumulative impact of the proposed development along with all other recently approved developments in the locality should be determined and included in the future baseline assessment. Consideration of proposed but not yet approved developments may be required and the applicant should check with the local authority before commencing the assessment.
- A table of traffic links and data utilised in the model should be included. The relevant transport links should also be detailed on a plan.
- Include the basis for NOx:$NO_2$ calculations.

### 3.5.5 Model scenarios

Include:

- A Baseline Year
- Predict air quality without the development for the operational year (Future Baseline)
- Predict air quality with the development for the operational year (With Development)
- Predict air quality with the development and other committed developments for the operational year (Cumulative Impact with Development).
- A further sensitivity analysis test is required in the following situations:
  - where the development site is within or adjacent to a declared AQMA(s)
  - where the development site is in, or adjacent to, areas where measured pollutant concentrations are within 10% of the AQO (i.e. 36ug/$m^3$ for $NO_2$)

  This test requires the modelling of a 'Without Emissions Reduction' scenario. WRS consider this provides a more appropriate conservative model of air quality impacts from developments that the Local Authority can be confident in. This is to address the issue identified by Defra (Carslaw, Beevers, Westmoreland, & Williams, 2011) that road traffic emissions have not been declining as expected. WRS acknowledge that real world emissions indicate Euro 6 compliant diesel vehicles have much lower NOx emissions than Euro 5, and that Euro VI HGVs are close to the emission limits. It is anticipated that vehicles sold in 2019 are very likely to meet the emission limit in the real world as this mode is part of the emission test. Real world emission test results that available circa 2015 were included in COPERT 5 however there has been no comprehensive comparison of how COPERT 5 compares to the current and growing extensive measurement database. Further information is available in WRS Sensitivity Rationale Note, available to view at http://www.worcsregservices.gov.uk/pollution/planning-and-pollution.aspx
- A summary table combining the various scenarios would be beneficial to clearly demonstrate the differences between the scenarios.

The operational year(s) will need to be agreed in advance with the Local Authority prior to commencement of the assessment.

### 3.5.6 Modelling Requirements for Point Sources

Emissions from point sources are released to the atmosphere through well-defined stacks, chimneys, or vents.

Much of the information detailed in section 3.5.1-11 is as relevant for modelling of point sources as for traffic related sources however some additional or alternative specific information will be required.

The assessment should give details of the emissions data and sources of data from the development including

- stack height above ground level
- stack internal diameter
- annual emissions for all pollutants of concern
- height, and location, of all nearby buildings which could prevent good dispersion of plume
- emission velocity
- exit stack temperature

Additional information on the requirements for stack height emission calculations can be found on the DEFRA website via the following link:-

https://laqm.defra.gov.uk/review-and-assessment/tools/modelling.html

### 3.5.7 Monitoring

In some cases it may be necessary for the applicant to conduct additional monitoring studies in order to allow appropriate model verification to be undertaken. This may be where existing monitoring locations are some distance from the area being assessed, no monitoring data is available for the area, or conditions in the study area vary greatly from the available data. The applicant is encouraged to discuss these requirements with WRS prior to undertaking any assessment.

- Any additional monitoring undertaken for the assessment should be compliant with *Defra Technical Guidance LAQM.TG (16)* paragraph 7.123.
- Measured data should be annualised as set out in paragraph 7.189 and Box 7.9 or Box 7.10 of *Defra Technical Guidance LAQM.TG (16)*.

- If monitoring locations are not representative of relative exposure locations use the Defra 'nitrogen dioxide fall off with distance' tool to calculate the necessary adjustments.
- Include (NGR) coordinates of additional monitoring positions and show on a diagrammatic plan.

### 3.5.8 Model Accuracy Verification

- *Defra Technical Guidance LAQM.TG (16)* paragraph 7.513 states that: '…model adjustment is not the first step in improving the performance of a dispersion model.' Please provide further information on the steps taken within the assessment to improve model uncertainty. WRS anticipate this will include a table of measured versus modelled data prior to adjustment and subsequent alteration as outlined in *Defra Technical Guidance LAQM.TG (16)* Box 7.15.
- Where only diffusion tubes are available to verify a model, WRS recommend as best practice that at least 3 separate monitoring locations are used (not triplicate). Using only one diffusion tube to verify a model is not acceptable due to the level of uncertainty introduced.
- Consideration should be given to any further improvements that can be made to the model to improve the primary adjustment factor. The primary adjustment factor should be provided in the report text.
- An explanation and justification for a primary adjustment factor greater than 2 following model improvements should be provided.
- Include modelling error in the report text (e.g. Root Mean Square Error). NB – *Defra Technical Guidance LAQM.TG (16)* paragraph 7.541 recommends a RMSE value less than 10% of the objective under consideration.

### 3.5.9 Assessment of Impacts

- Include a table of the impact of the development (as defined within the Environmental Protection UK/Institute of Air Quality Management EPUK/IAQM 2017 'Land Use planning and Development Control: Planning For Air Quality' guidance) at each sensitive receptor point for each scenario.
- Demonstrate the results on concentration contour maps of the study area

### 3.5.10 Cost of Impacts

To assess the cost/benefit impacts of a development on air quality one of the following techniques should be used:

- Damage Cost Approach - If the impacts are less than £50 million and do not affect compliance with the air quality objectives.
- Impact Pathway Approach - If impacts are greater than £50 million.
- Unit Abatement Cost Approach - If the development is expected to affect compliance with the air quality objectives and the impacts are less than £50 million.

The above information is taken from the document 'DEFRA Abatement cost guidance for valuing changes in air quality May 2013' and can be accessed via the following link:-

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197898/pb13912-airquality-abatement-cost-guide.pdf

### 3.5.11 Data requests and file formats

- WRS may request copies of the model Log files, Input files and Output files for the modelling run relating to the results submitted and use ADMS Roads to confirm the outcomes of the report.
- Separate files for each pollutant contour: Export the contoured pollutants GIS file as a TIFF and add a word file so that they can be imported into WRS's GIS as required

## 3.6 Mitigation measures

Where an assessment identifies that a development will have a detrimental impact on local air quality details should be provided on appropriate mitigation measures that would avoid, reduce or offset the impact of development. Even where the effect is judged to be insignificant, consideration should be given to the application of good design and good practice measures to minimise the impact on air quality.

Paragraph 8 of the National Planning Practice Guidance states:-

***'How can an impact on air quality be mitigated?***

*Mitigation options where necessary will be location specific, will depend on the proposed development and should be proportionate to the likely impact. It is important therefore that local planning authorities work with applicants to consider appropriate mitigation so as to ensure the new development is appropriate for its location and unacceptable risks are prevented. Planning conditions and obligations can be used to secure mitigation where the relevant tests are met.*

*Examples of mitigation include:*

- *the design and layout of development to increase separation distances from sources of air pollution*
- *using green infrastructure, in particular trees, to absorb dust and other pollutants;*
- *means of ventilation;*
- *promoting infrastructure to promote modes of transport with low impact on air quality;*
- *controlling dust and emissions from construction, operation and demolition; and*
- *contributing funding to measures, including those identified in air quality action plans and low emission strategies, designed to offset the impact on air quality arising from new development.'*

(Paragraph: 008 Reference ID: 32-008-20140306 Revision date: 24.07.2018)

Applicants are required to work with WRS and the local planning department to consider appropriate mitigation so as to ensure that new development is suitable for its location and unacceptable impacts and risks are prevented.

Where an air quality assessment finds that mitigation measures will be necessary an options appraisal of potential solutions should be undertaken. Proposed mitigation measures should be assessed to determine what impacts they may have and supporting evidence included in the assessment.

Innovative solutions to air quality mitigation are encouraged. The type of mitigation required on a particular development will be informed by:

- Outcomes from the Air Quality Assessment / Transport Statement / Emission profiling
- Specific needs identified in site specific spatial policy allocations
- Travel Awareness / Planning and Highway Development requirements
- Latest Defra air quality guidance (Defra Measures Guidance)
- Relevant technical guidance and acknowledged best practice

## 3.7 Planning Obligations and Conditions

### 3.7.1 Use of planning obligations and planning conditions

Air quality mitigation measures are ideally integrated into a development's design. Where this is not the case there are other tools that can be used within the planning process to secure required mitigation measures or development of necessary infrastructure.

Many planning applications are granted permission subject to conditions. Conditions are used to secure a quality development and reduce adverse impacts that might follow.

A planning obligation under Section 106 of the Town and Country Planning Act 1990 (as amended) can also be used to secure site specific mitigation mechanism.

Government guidance advises that where there is a choice between imposing planning conditions and requiring the developer to enter into a planning obligation or S106 Agreement, the imposition of planning conditions is considered preferable.

### 3.7.2 Planning Obligations and Section 106 Agreements

Planning obligations are agreements made between local authorities and developers to make developments acceptable which would otherwise be unacceptable in planning terms. If on-site mitigation is not possible then the Local Planning Authority will seek compensation for the identified air quality impacts through a Section 106 agreement. Such agreements are a delivery mechanism for matters that are necessary to make the development acceptable, either through mitigation or compensation.

### 3.7.3 Standard Planning Condition Requirements

As referred to above planning permission may be granted subject to certain air quality planning conditions to help lessen impact of development on local air quality. These conditions are used to ensure appropriate assessment and mitigation measures and to also encourage sustainable air quality neutral development through more general requirements, such as provision of electrical vehicle charging points, as set out below.

- Conditions and planning obligations seeking to improve air quality may take a number of forms. The below is an indicative list of conditions or obligations that can be employed with the aim of reducing impacts on air quality from development: submission of emissions assessment and a site specific low emission strategy
- maintenance of pollution emitting plant
- measures to reduce emissions including implementation of travel plans and sustainable building design
- *restricting on site car parking provision*
- making provisions for alternative forms of transport
- electronic charging points for vehicles or contributions to public transport improvements
- low-NOx boilers
- secure cycle parking and implementation of cycle ways and other infrastructure
- financial contribution to an air quality action fund

### 3.7.5 Electric Vehicle Charging Points, Low Emission Boilers, and Secure Cycle Parking

As a minimum, new developments, large and small, should include the provision of electric vehicle charging points, the installation of low NOx boilers, and provision of areas for secure cycle parking, where these are applicable to the development. Even where air quality is considered to be good these measures help to future proof development and alleviate pollution creep in the wider area. The provision of more sustainable transport modes will help to reduce $CO_2$, NOx and particulate emissions from transport.

WRS recommend that **secure cycle parking** facilities are incorporated into the design of commercial developments and domestic plots without sufficient exterior space to allow for secure cycle storage.

**Electric vehicle charging points** should, as a minimum, be installed in 10% of the allocated parking spaces of a commercial development. Appropriate cabling and an outside electrical socket should be supplied for each residential property to enable ease of installation of an electric vehicle charging point (houses with dedicated parking). For developments without allocated parking (flats/apartments) a minimum of 1 EV charging point per 10 spaces should be provided by the developer to be operational at commencement of development.

Boiler NOx emissions from building heating systems contribute to background NOx concentrations. **Ultra-Low NOx boilers** with maximum NOx Emissions less than 40mg/kWh are recommended for use in residential property and commercial development where suitable.

WRS recommend that the above measures are incorporated into all new developments that comprise 10 residential dwellings or more or a retail, leisure, commercial, or industrial development with ten or more parking spaces. These standard measures do not preclude the need for an air quality assessment and any further mitigation measures as may be required. The WRS standard air quality mitigation measures are included in Annex 2.

### 3.7.6 Traffic Reduction and Low Emission Strategies

Emissions from road traffic are the dominant source of elevated pollutant concentrations across Worcestershire and all AQMAs have been declared for this reason. WRS, the District Councils and Worcestershire County Council promote transport infrastructure that has low impact on air quality.

This **could** include:

- provision of infrastructure for low emission vehicles such as electric vehicle recharging points
- green travel plans
- provision of cycling facilities such as cycle paths and secure cycle storage
- adoption of car free and car capped developments
- provision of car club bays

Worcestershire County Council's Local Transport Plan 4 includes approaches to improving air quality through various transport measures and schemes, including proposals for:-

- Lickey End (M42 Junction 1) major junction enhancement
- Bromsgrove A38 Strategic Corridor
- Redditch Transport Strategy
- Bromsgrove Transport Strategy
- Southern Link Road (A4440) Phase 4 Major Enhancement
- Strategic Active Travel Corridor Schemes for South Worcestershire
- Worcester City Centre Transport Strategy
- Kidderminster Transport Strategy
- Bewdley Transport Strategy

More information relating to Worcestershire County Council's Local Transport Plan 4 can be found via:-

http://www.worcestershire.gov.uk/LTP

### 3.7.8 Reducing Dust Impacts

Dust and emissions from the construction and demolition of buildings has the potential to significantly impact local air quality. A Construction Environmental Management Plan (CEMP) will ensure that best practice mitigation measures are implemented during the construction phases of a development. Reference should be made to the WRS document 'Code of Best Practice for Demolition and Construction Sites'.

## Annex 1 References


1. Black Country (September 2016) 'Air Quality Supplementary Planning Document'
2. Department for Communities and Local Government (March 2012) 'National Planning Policy Framework'
3. DEFRA (2013) 'Abatement cost guidance for valuing changes in air quality'
4. DEFRA (2016) 'Local Air Quality Management Policy Guidance LAQM PG.(16)'
5. DEFRA (2016) 'Local Air Quality Management Technical Guidance LAQM TG.(16)'
6. EPUK/IAQM (Jan 2017) 'Land Use Planning & Development Control: Planning for Air Quality'
7. National Institute for Health Care Excellence (NICE) (June 2017) 'Air Pollution: outdoor air quality & health (draft guidance)'
8. National Planning Practice Guidance – Air Quality (July 2018)
9. Warrington Borough Council (2013) 'Environmental Protection Supplementary Planning Document'
10. West Midlands Low Emissions Towns & Cities Programme (May 2014) 'Good Practice Air Quality Planning Guidance'
11. Worcestershire County Council (2017) 'Worcestershire's Draft Local Transport Plan (LTP4) 2017-2030'
12. Worcestershire Regulatory Services (2013) 'Air Quality Action Plan for Worcestershire'
13. Worcestershire Regulatory Services (2015) 'Air Quality Action Plan Progress Report for Worcestershire April 2013-April 2015'
14. Worcestershire Regulatory Services (2016) 'Air Quality Action Plan Progress Report for Worcestershire April 2015 – March 2016'

## Annex 2 WRS Standard Conditions for Air Quality

**Air Quality Impact Assessment**

An air quality assessment should be undertaken by the developer to assess potential health risks to residents of the new development in respect of local air quality and determine if further measures are required to mitigate risks.

**Air Quality Assessment Condition**

Prior to the commencement of development the developer must provide an Air Quality Impact Assessment. The Air Quality Impact Assessment must be undertaken by a suitably qualified professional(s). The Air Quality Impact Assessment must consider the impact of the development on local air quality and relevant sensitive receptors, the impact of existing local air quality on the development and relevant sensitive receptors and any necessary mitigation. Additionally, the cumulative impact of all locally committed developments (small scale and large scale major sites i.e. ≥ 10 properties) on existing local air quality must be considered to assess if further mitigation measures, other than those recommended as part of the above, are required.

The details of all required mitigation measures identified as part of the above must be agreed with the Local Planning Authority. All required mitigation measures must be carried out in accordance with the details agreed by the Local Planning Authority prior to the operation/occupation of the development.

**Reason:**

To assess the potential health risks to relevant sensitive receptors from local air quality and identify required mitigation measures. NPPF Paragraph 181 states *"Planning policies 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. 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."*

Additionally, NPPF Paragraph 102 states: *'Transport issues should be considered from the earliest stages of plan-making and development proposals, so that the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains.'*

**Secure Cycle Parking**

It is recommended that secure cycle parking facilities are incorporated into the design of commercial developments and domestic plots without sufficient exterior space to allow for secure cycle storage. Full details of the location, type of rack, spacing, numbers, method of installation and access to cycle parking should be provided as determined by Worcestershire County Council Design Guidance (note this is also an option in BREEAM assessments).

**Condition - Secure Cycle Parking**

Secure cycle parking facilities should be provided at the development as determined by Worcestershire County Council Design Guidance. Full details of the location, type of rack, spacing, numbers, method of installation and access to cycle parking should be submitted to and approved by the local planning authority prior to the first occupation of the development.

**Reason:**

NPPF Paragraph 102 and 103 state*; "Transport issues should be considered from the earliest stages of plan-making and development proposals, so that opportunities to promote walking, cycling and public transport use are identified and pursued' and 'Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health."*

**Electric Vehicle Charging – Commercial Development**

It is recommended that electric charging points be installed in 10% (as a minimum) of the allocated parking spaces at the development. The provision of more sustainable transport modes will help to reduce $CO_2$, NOx and particulate emissions from transport.

**Condition - Electric Vehicle Charging Points for Commercial Properties**

Electric charging points shall be installed in 10% (as a minimum) of the allocated parking spaces at the development. This may be phased with 5% of spaces operational initially and a further 5% of spaces made EV recharging ready (i.e. incorporating appropriate cabling) to allow additional provision to meet future demand. The Developer is responsible for ensuring the charging point complies with BS EN 62196 Mode 3 or 4 charging and BS EN 61851. As a minimum, charge points should comply with Worcestershire County Council Design Guide which requires 22kw charging points for non residential developments.

**Reason:**

Paragraph 105 and 110 of the NPPF state; *"If setting local parking standards for residential and non-residential development, policies should take into account the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles" and "Applications for development should be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."'*

**Electric Vehicle Charging – Domestic Development**

The provision of more sustainable transport modes will help to reduce $CO_2$, NOx and particulate emissions from transport. In order to make the properties ready for EV charging point installation, appropriate cable provision and isolation switches must be installed that can be adapted to an appropriate dedicated socket for electrical vehicles to be charged in the garage, driveway or allocated car parking space. For developments with unallocated parking i.e. flats/apartments 1 EV charging point per 10 spaces (as a minimum) should be provided by the developer to be operational at commencement of development.

**Condition - Electric Vehicle Charging Points for Domestic Properties**

Appropriate cabling and an outside electrical socket must be supplied for each property to enable ease of installation of an electric vehicle charging point (houses with dedicated parking).. The wiring must comply with BS7671. The socket should comply with BS1363, and must be provided with a locking weatherproof cover if located externally to the building. The cable and switches should be installed such as they can be adapted to an EV chargepoint that complies with BS EN 62196 Mode 3 or 4 charging and BS EN 61851 in the future.

For developments with unallocated parking i.e. flats/apartments 1 EV charging point per 10 spaces (as a minimum) should be provided by the developer to be operational at commencement of development. The charging point must comply with BS EN 62196 Mode 3 or 4 charging and BS EN 61851. As a minimum, charge points should comply with Worcestershire County Council Design Guide which requires 7kw charging points for residential developments.

**Reason:**

NPPF Paragraphs 105 and 110 state; *"If setting local parking standards for residential and non-residential development, policies should take into account the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles" and "Applications for development should be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."*

**Low Emission Boilers**

Boiler NOx emissions from building heating systems contribute to background NOx concentrations and the following condition is recommended; (note this is also an option in BREEAM assessments and the cost of a low NOx boiler is the same as a standard boiler)

**Low Emission Boilers Condition**

Details shall be submitted to and approved by the local planning authority prior to the first occupation of the development for the installation of Ultra-Low NOx boilers with maximum NOx Emissions less than 40mg/kWh. The details as approved shall be implemented prior to the first occupation of the development and shall thereafter be permanently retained.

**Reason:**

In the interests of the living conditions of occupiers of nearby properties and future occupiers of the site.

# 4. Contaminated Land Technical Guidance

## 4.1 Introduction

This chapter within the Technical Guidance Document (TGO) sets out the requirements for how land affected by contamination should be dealt with as part of the planning process. The document also provides a specification as to the technical standards expected for contaminated land reports submitted in support of planning applications and discharge of condition requests.

Contamination in or on land can present risks to human health and the wider environment. This can adversely affect or restrict the beneficial use of land. Often development presents the best opportunity to successfully deal with these risks. The planning system has a key role to play in facilitating the development of land affected by contamination.

The role of the planning system is to control future development and land use. The actual or possible presence of land contamination is a material planning consideration. The majority of land in the UK that is affected by contamination is addressed during development.

Current government planning policy states that as a minimum, land following development should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990 (National Planning Policy Framework (NPPF)). The development, after remediation, should be demonstrated to be ‘safe’ and ‘suitable for use’.

Failure to adequately address land contamination could cause harm to human health, property and the wider environment. It could also:

- Limit or prevent subsequent development.
- Result in difficulties with the conveyancing process.
- Result in future liabilities for remediation under the Environmental Protection Act 1990 Part 2A.

The responsibility for securing a safe development rests with the developer and the landowner.

As precaution, the possibility of contamination should always be assumed when considering developing sites on or near former industrial land or where the proposed end uses are particularly sensitive to contamination such as housing, schools or children's play areas.

## 4.2 Roles and Responsibilities

### 4.2.1 The Developer

The developer is responsible for ensuring that their development is safe and suitable for use for the purpose for which it is intended. The developer is therefore responsible for determining whether land is suitable for a particular development, or can be made suitable by remedial action, and any costs associated with investigative and remedial works. The developer should arrange for a **competent person** to carry out the appropriate investigation to inform the risk assessment so as to determine whether the land is affected by contamination and what action is required to mitigate risk. Section 4.5 details what is meant by the term 'competent person' in this respect.

Where an agreed remediation scheme includes future monitoring and maintenance schemes, arrangements will need to be made to ensure that any subsequent owner is fully aware of these requirements and assumes on-going responsibilities that run with the land.

### 4.2.2 The Local Planning Authority

The Local Planning Authority (LPA) is responsible for the management of development and its impacts. In doing so the LPA has a duty to take account of all material considerations including contamination. It is the role of the LPA to plan for land uses that are appropriate in the light of all the relevant circumstances, including known or suspected contamination, and to determine applications, including applying and enforcing any necessary conditions. Such conditions may require that land is remediated in the course of development to an appropriate standard, taking account of its intended use, and to be properly maintained thereafter if required.

When considering development on land affected by contamination the principal planning objective is to ensure that any unacceptable risks to human health, property, and the wider environment, are identified and action taken to address those risks.

The LPA should adopt a precautionary approach and assume the possibility of contamination when formulating development plans and considering individual planning applications in relation to all land, on or adjacent to, previous industrial use. A conservative approach should also be adopted where the proposed use is considered to represent vulnerable receptors particularly sensitive to contamination. This would include housing, allotments, schools and nurseries, children's play areas and hospitals.

Where development is proposed on land that is, or may be, affected by contamination, an assessment of risk should be carried out by the applicant for consideration by the LPA before the application is determined. Any existing or new unacceptable risks should be identified and proposals put forward to deal with them effectively as part of the development process.

### 4.2.3 The Role of Worcestershire Regulatory Services (WRS)

WRS act as advisor to Bromsgrove District Council, Malvern Hills District Council, Redditch Borough Council, Wychavon District Council, and Wyre Forest District Council on planning applications where contamination is identified as a potential concern. As part of this process of consultation WRS review any available information provided with the planning application as well as the departmental records held and make further information requests or technical recommendations as required.

## 4.3 The planning process

### 4.3.1 Pre-application

Where a large scheme or development is proposed on land that is or may be affected by contamination, it is strongly recommended that an assessment of risk should be carried out by the developer in lieu of submitting a full planning application. Any existing or new unacceptable risks should be identified and proposals made to deal with them effectively as part of the development process. Where practicable, developers should arrange pre-application discussions with the LPA and other regulators once this work has been undertaken.

### 4.3.2 Granting Planning Permission

Where the LPA is satisfied that the proposed development is appropriate, having regard to any relevant information available about the contamination status of the site, planning permission may be granted subject to any conditions deemed necessary. These conditions may require further site investigation, risk assessment, remediation and mitigation and any suitable validation and verification.

The LPA will refuse permission if it is not satisfied on the basis of the information provided by the applicant and that available from other sources, including the responses of those consulted, that the development would be appropriate. This could include cases in which:

- circumstances, including information available to the LPA, clearly suggest the possibility of contamination or of unacceptable risk and no information has been provided or obtained that excludes the reasonable possibility of such contamination or risk

- the LPA considers that unacceptable risk exists and there is no evidence to suggest that it can be dealt with adequately to deliver a development that is suitable for its intended use and which results in the removal of such risks, or
- the steps needed to deliver an appropriate development and deal with unacceptable risk are not already in place and cannot be secured by suitable planning conditions; for example, because these are not within the powers of the developer since action is needed on other land outside the developer's control or influence.

### 4.3.3 Planning Conditions

The LPA will need to be satisfied that the proposal will deliver an appropriate development, that the risks are sufficiently well known and that there is a viable remediation option. If it is so satisfied it may be appropriate to grant permission subject to conditions relating to the condition of the land.

The LPA will generally use a series of staged conditions that aim to:

- provide for preliminary risk assessment and characterisation of the site to confirm the nature and extent of contamination
- development of a remediation scheme that ensures the removal of unacceptable risks to make the site suitable for use
- a validation report that demonstrates works undertaken and the effectiveness of the remediation carried out and any post construction monitoring
- a contingency plan for dealing with unexpected contamination

Although it is desirable that this process is completed before building works begin, for larger sites it may be necessary that investigation and remediation is undertaken on a phased basis. This process should be agreed with the LPA prior to undertaking and set out in detail within the remediation scheme.

The differences between perceived and actual risk from contamination are such that a validation report is essential to demonstrate that, following remediation, the site is suitable for use. This should include details of all the actions taken at each stage of the process, from initial investigations and assessment through to carrying out and verification of remediation works.

Pre-commencement conditions for contaminated land risk assessment are considered necessary for the following reasons:

- There is potential for contamination to exist on the site. The degree and extent of contamination is currently unknown. More information relating to ground conditions is required to determine whether or not remediation will be required (prior to any construction work commencing).

- Where remediation is necessary, this remediation may involve work/techniques that need to be completed before any development is commenced, for example the removal from site of contaminated soils/underground structures, the design and incorporation of gas protection measures in any buildings

etc. To carry out such work after construction has started/been completed, may require potentially expensive retro-fitting and in some cases the demolition of construction work already completed.

NPPF Paragraph 178 states; *"Planning policies should ensure that a site is suitable for its proposed use taking account of ground conditions, any risks arising from contamination, and any proposals for mitigation, including land remediation."* and *"After remediation, as a minimum, land should not be capable of being determined as Contaminated Land under Part 2A of the Environmental Protection Act 1990."*

A list of standard conditions developed by WRS and commonly recommended to the LPA can be found at Annex 1 below.

## 4.4 Reporting

### 4.4.1 Reporting Requirements

Information submitted in support of planning applications must be of an acceptable minimum standard in order to satisfy the LPA. The guidance contained within this section aims to inform developers of the procedural requirements of a risk-based approach to land contamination, as defined in current UK legislation and guidance.

A detailed technical framework for investigating and dealing with land affected by contamination is contained within the Environment Agency guidance document "*Land Contamination: Risk Management*" (LCRM). The process involves identifying, making decisions on, and taking appropriate action to deal with, land contamination in a way that is consistent with government policies and legislation. The approach outlined below is consistent with the LCRM technical framework and is based on a staged or tiered approach to risk assessment, which includes the following four key elements:

- Risk Screening;
- Generic and/or Quantitative Risk Assessment (GQRA/DQRA)
- Remediation
- Verification / Validation.

Risk screening generally involves developing a Conceptual Site Model (CSM), which identifies whether there could be any potentially unacceptable risks at the site. The CSM is then used to determine if any further assessment is required and inform the scope of any further assessment. If this preliminary assessment clearly demonstrates that contamination at the site poses no unacceptable risks (i.e. no source-pathway-receptor linkages) then further risk assessment may not be required.

The procedure for investigating a potentially contaminated site is expected to meet the criteria outlined in British Standard BS10175:2011 + A2:2017 *'Investigation of Potentially Contaminated Sites – Code of Practice'* as amended.

Typical components of a report submitted in support of a planning application would generally include the following stages (A-D):

- STAGE A: Preliminary Risk Assessment (PRA) (often referred to as a Phase 1 Investigation or Desk Study);
- STAGE B: Site Investigation & Risk Assessment (GQRA/DQRA);
- STAGE C: Remediation Scheme;
- STAGE D: Verification Report (often referred to as a Validation or Completion Report).

All works undertaken during the process of risk assessment should be in line with, and make reference to, the National Planning Policy Framework 2018, the Environment Agency's '*Land Contamination: Risk Management*' (LCRM) guidance, and BS10175:2011 (+A2:2017).

### 4.4.2 STAGE A: Preliminary Risk Assessment (PRA)

A PRA (sometimes referred to as a 'Phase 1 Investigation' or 'Desk Study') should provide a preliminary assessment of risk by interpreting information on a site's history, considering the likelihood of contamination being present and making an initial hazard assessment. A PRA typically consists of a desk study, site reconnaissance, development of an initial CSM and a preliminary risk assessment.

A PRA should include a search of available information and historical maps, which can be used to identify the likelihood of contamination existing on a site. The two main indicators for the likely presence of contamination at a site are any past industrial uses and close proximity to a landfill.

As a minimum requirement the developer must provide a full PRA and details of a site walkover. Whilst they may provide a useful indication of the possible presence of contamination, commercial environmental searches will not be sufficient to establish the presence or absence of land contamination on their own. An environmental search does not represent a comprehensive PRA since these searches only provide factual information, although a useful addition to a PRA. Interpretation is necessary to develop a CSM, which identifies plausible pollutant linkages as a basis for assessing risk.

If the PRA findings indicate that no contamination concerns exist at the site then further action may not be necessary, although it is a requirement to submit the report and confirm this with the LPA before proceeding. Where the PRA and site walkover do not provide sufficient information to assess the risks and appraise remedial options, further investigations will need to be carried out before the application is determined.

### 4.4.3 STAGE B: Site Investigation & Risk Assessment (GQRA/DQRA)

A Generic Quantitative Risk Assessment (GQRA - often referred to as Phase 2 site investigation) aims to reduce the uncertainties identified in the initial CSM by quantifying potential contamination at the site. The data obtained will be used to inform a decision as to whether the site is potentially harmful. A GQRA report generally consists of an intrusive site investigation and a subsequent generic risk assessment. The investigation process should clearly identify and characterise plausible source-pathway-receptor linkages at the site and provide information for the refinement of the initial CSM.

The rationale for decisions made during the site investigation should be clearly stated in the site investigation report. Reasons for sample locations and for sample omissions in certain areas, sampling depths, suites of contaminants tested for, and any other relevant details should be clearly explained. Whilst these decisions might seem obvious at the time of the investigation this is not always the case when the report is being reviewed.

Any samples taken during a site investigation should be carried out in accordance with BS ISO 18400-105:2017 *'Soil quality. Sampling, Packaging, Transport, Storage and Preservation of Samples'* and sent to an appropriately accredited laboratory for analysis.

WRS may request a Detailed Quantitative Risk Assessment (DQRA) where levels of contaminants are identified above the GQRA criteria or where large amounts of contamination are encountered to determine whether there are actual risks to identified receptors. DQRA can also be used to derive remediation targets for levels of contamination which will remain on site following any proposed remedial works.

Should the GQRA/DQRA findings confirm that no contamination concerns exist at the site, then further action will not be necessary. However, it is recommended that confirmation is sought with the LPA before proceeding with the development.

### 4.4.4 STAGE C: Remediation Scheme

Often known as a 'Remediation Strategy', this is a document detailing what action is to be carried out to ensure contamination no longer presents a risk to site users, property or ecological systems. The document is produced after an 'Options Appraisal' has taken place, where various remedial options are considered. A remediation scheme may include measures such as the removal of contamination, encapsulation of contaminants, treatment of contaminants or measures to break pollution linkages. Please note that Government policy encourages sustainable methods of remediation.

A Remediation Scheme should be submitted where a site investigation identifies levels of contamination that will require remediation prior to the site being suitable for its intended use. This strategy should include full details of how contamination at the site will be addressed and demonstrate that the standard of remediation work complies with current best practice and guidance.

The Remediation Scheme should be submitted to LPA for approval before site works commence.

### 4.4.5 STAGE D: Verification / Validation / Completion Report

Where contamination has been found and remediated a verification report must be produced to confirm any remedial works undertaken. Verification must be undertaken in accordance with current UK guidance and best practice. All remediation and mitigation measures should be detailed and documentary evidence provided. This could include, but is not limited to, photographs, technical specifications, design plans, consignment notes, certificates of analysis, monitoring results, sign off sheets and statement from fitters or contractors.

In certain circumstances it may be required for the developer to conduct post-completion monitoring. This will need to be undertaken to the LPA's requirements. For limited remediation works or protective works a verification statement alone may be acceptable, but prior confirmation of this should be obtained from the LPA.

### 4.4.6 Time Scale and Programming

It should be noted that an intrusive investigation and subsequent risk assessment can take some time to complete depending on the complexity of the site. Gas monitoring may need to be conducted for periods of 6 or 12 months where landfill or ground gas is a concern to ensure adequate characterisation of the area. Hence sufficient time should be set aside in the development programme to enable the necessary works and reporting to be undertaken. A rushed or premature assessment that fails to adequately assess the risks may be rejected. An allowance should also be made for a period of review to ensure the works undertaken are accepted by the LPA. In addition remediation works may take time to complete, certainly in the case of bioremediation processes, and allowances should be made for this when determining timescales.

It is strongly recommended that the developer's progress of assessment to remediation to construction is reported to the LPA at all necessary milestones. Failure to follow this recommendation may result in significant delays, denial to the discharge of conditions and expensive additional costs where the developer has to re-visit steps in the process to provide the necessary reassurances sought by the LPA.

### 4.4.7 Category 4 Screening Levels (C4SLs)

C4SLs are intended to be generic screening values for use in the Part 2A regime to help local authorities decide when to stop further assessment of a site on the ground that it falls within Category 4 (Human Health). C4SLs represent a "low risk" (excess lifetime cancer risk of 1 in 50,000) approach as opposed to the "minimal risk" (excess lifetime cancer risk of 1 in 100,000) approach adopted for derivation of Soil Guideline Values (SGVs) and Generic Assessment Criteria (GAC). This approach is endorsed by DEFRA and the DCLG; however other organisations, such as the Chartered Institute of Environmental Health, the Committee on Toxicology and the Committee on Carcinogenity have expressed concerns that C4SLs are not based on minimal risk toxicological criteria and are therefore not sufficiently conservative.

When assessing sites through the planning process developers are encouraged to first screen sites against "minimal risk" SGVs/GACs/S4ULs (Suitable 4 Use Levels) before using C4SLs. Where C4SLs are used full justification will be required, this must include a clear rationale for why C4SLs have been used when more conservative values are available.

In addition, it should be noted that C4SLs are not applicable to all sites; for example they are based on a sandy loam soils with 6% organic matter and would therefore not be appropriate for sites with soil conditions that differ from this.

It should also be noted where a risk assessment indicates an exceedence of a minimal risk GAC but not the C4SL a higher degree of confidence, site information and characterisation will be required in any reporting. This is to ensure that the site is safe and suitable for use as is required within the current planning regime.

### 4.4.8 Landfill Sites and Significant Areas of Unknown Filled Ground

Some sites may be completely undeveloped and have no history of any use associated with contamination. However, they may be located within 250m of a landfill site or significant area of unknown filled ground. These are sites that have been excavated historically and then filled with waste materials which may comprise household, commercial, industrial, inert, and other types of waste.

Landfill gas is produced during the degradation process of organic waste. The gas produced is mainly composed of methane and carbon dioxide, with trace amounts of volatile organic compounds and other gases depending on the materials deposited within the landfill. Following the path of least resistance, gas will migrate either vertically to the atmosphere or laterally beyond landfill boundaries into the surrounding geological formations. The gas may then release to air. Gas migration to the atmosphere may represent a threat to human health if it enters a domestic property or other building in sufficient quantities. Methane is explosive in volumetric concentrations of 5% to 15% when mixed with air. Infiltration of carbon dioxide and other landfill gases into an enclosed space, such as a cellar, may also represent a risk of asphyxiation. Several of the other organic compounds found in landfill gas also present health hazards in sufficient quantities. Buildings constructed on or near landfill sites and other significant areas of unknown filled ground maybe at risk from landfill gas.

As a precautionary measure WRS recommend that all new dwellings built within 250m of a landfill site, or significant area of unknown filled ground, incorporate adequate gas protection measures as part of the building design, unless an appropriate risk assessment is undertaken that determines otherwise. These recommendations are also made for other commercial buildings and structures where there may be a risk to human health. Gas protection measures should prevent ingress of landfill gas, namely methane and carbon dioxide, and appropriate verification of these works should be provided to the LPA. Verification must be carried out in accordance with current UK guidance and best practice.

Where planning applications are for extension to a domestic dwelling or commercial property with existing gas protection measures, WRS recommend that these measures are also incorporated into the extended area to ensure the existing measures are not compromised

Agreement should be sought from the LPA prior to installation of any gas protection measure to ensure they are considered adequate. Following installation verification of the works should be provided in accordance with section 4.5.5 of this document.

## 4.5 Competency & Standard of Reporting

### 4.5.1 Background

The National Planning Policy Framework (NPPF) states in paragraph 178 that ***'Planning policies and decisions should also ensure that: adequate site investigation information, prepared by a competent person, is available to inform these assessments'.***

The Glossary in Annex 2 of the NPPF provides a definition for the term 'competent person', which is reproduced below.

***"Competent person (to prepare site investigation information): A person with a recognised relevant qualification, sufficient experience in dealing with the type(s) of pollution or land instability, and membership of a relevant professional organisation."***

Reports that are ambiguous or contain errors or omissions will be rejected as they cannot be used or relied upon for decision making and the LPA will be advised accordingly.

### 4.5.2 Professional Competence, Relevant Experience and Professional Memberships

It is important that any assessment of risk from contamination is undertaken by a competent person. The NPPF requires that person to have relevant qualifications, sufficient experience and membership of a relevant professional organisation.

A qualified person with experience will be able to follow the principals of the Environment Agency's 'Land Contamination: Risk Management' guidance and assess a site in line with current UK guidance and best practice. This will minimise omission or inaccuracy and not hinder any review during the planning process.

The membership of a relevant professional organisation is important because it helps to demonstrate the standard of the person concerned, their knowledge with regard to changing best practice and legislation as well as providing a method of recourse where there is an issue of concern.

### 4.5.3 The National Quality Mark Scheme for Land Contamination

On January 9th 2017 the National Quality Mark Scheme for Land Contamination (NQMS) was launched by the Land Forum. The purpose of the scheme is to vet and identify persons within the contaminated land community that are competent to such an extent that their work and oversight of projects can be passed though the development control system without the need for extensive checking by other professionals in the field such as WRS. These competent persons are referred to as Suitably Qualified and experienced Person (SQP)

The Land Forum maintains a list of SQPs in compliance with this scheme. Whilst SQP's are not necessarily required for such work, WRS recommend their appointment for expediency purposes.

The eligibility criteria for suitably qualified persons can be found at: https://www.claire.co.uk/projects-and-initiatives/nqms/83-supporting-sqp-process/271-what-is-a-suitable-qualified-person

### 4.5.4 Verification of gas protection measures professional competency

The testing and verification of installed ground gas protection measures must be carried out in accordance with current UK guidance and best practice, namely BS84845:2015 "Code of practice for the design of protection measures for methane and carbon dioxide ground gases for new buildings" and CIRIA C735 "Good practice on the testing and verification of protection systems for buildings against hazardous ground gases".

Testing and verification of installed ground gas protection measures must be undertaken by a suitably qualified and experienced independent third party. A verification report must be completed in accordance with current UK guidance and best practice.

Accreditation for professionals working in ground gas verification is available through the CL:AIRE Gas Protection Verification Accreditation Scheme. Formal NVQ qualifications are available in the fields of the installation of gas protection measures and the verification of ground gas protection systems.

### 4.5.5 Standard of Contamination Reports

All reports submitted in support of the planning process, whether with planning applications or as supporting material to discharge conditions must be of a good standard and be consistent with the Environment Agency's "Land Contamination: Risk Management" guidance. Good quality reports can be reviewed quickly and those that are well laid out will aid this further.

Substandard reports will be rejected. It is expected that all reports meet the basic standards required by UK national guidance and best practice. Where the report has been prepared appropriately and has minor omissions, errors or lacks clarity these will be raised for rectifying. Where a report has failed to meet the basic standard, the report will be rejected with reference to the guidance it fails to comply with.

The Local Planning Authority does not provide a consultancy service or training for consultants to become competent persons.

## Annex 1 Checklist for reports submitted in support of planning applications

This checklist provides a brief, at-a-glance guide as to what the various stages of geo-environmental assessments should contain. The list is not exhaustive, and as such the contents of any site reports will vary due to the site-specific issues e.g. the past use of the site, the nature and extent of contamination, and the proposed end use of the site. Rationale behind decision making and methodologies should be included in all reports.

**Phase I Assessment**

**Hazard Identification**

- Purpose and aims of the study;
- Site location and layout plans appropriately scaled and annotated;
- Appraisal of former site uses from historical maps, business directories and local knowledge (including library records etc);
- Details of any Environmental Information Regulations searches undertaken – District Councils, Planning Departments, Environment Agency;
- Appraisal of site walkover study considering any obvious signs of contamination, damage to fauna, flora or eco-systems that may be pollution related, stockpiles of material or fly-tipping;
- Assessment of environmental setting to include – geology, hydrogeology, hydrology; information from the Environment Agency on abstractions, pollution incidents, water classification, landfill sites within 250m; information on coal workings (if appropriate);
- Assessment of current / proposed site use and surrounding land use;
- Identification of likely contaminants of concern; and,
- Review of any previous site contamination studies (desk based or intrusive) or remediation works.

**Hazard Assessment**

**Preliminary assessment of risks to include:**

- Appraisal of potential contaminant sources, pathways and receptors;
- Identification of pollutant linkages;
- Development of a conceptual site model; and,
- Proposals for intrusive site investigation, if required.

**Phase 2 Assessment / Site Investigation**

**Risk Estimation**

The design and implementation of a site specific investigation including:

**Site investigation methodology including:**

- Plan showing exploratory locations, on-site structures, above / below ground storage tanks etc (appropriately scaled and annotated);
- Justification of exploratory locations and depths;
- Sampling and analytical strategies;
- Borehole / trial pit logs

(All chemical testing data produced on contaminants in soils should be produced by a laboratory accredited with current quality standards (i.e. UKAS and MCERTS) for the testing methods used. Results should be accompanied by an estimate of precision, a description of the testing methods used and a signature of appropriate laboratory staff responsible for the testing).

**Results and findings of investigation, including:**

- Description of ground conditions encountered;
- Copies of laboratory results;
- Discussion of soil / gas monitoring / groundwater / surface water contamination encountered;
- Updated conceptual site model based on findings.

**Risk Evaluation**

- Risk assessment against appropriate assessment criteria e.g. SGVs, S4ULs, site specific assessment criteria etc;
- Justification of a site-specific risk assessment carried out – detailing all assumptions made and sources of input data;
- Reasoning as to whether an estimated risk is judged to be unacceptable;
- Recommendations for any further investigation work considered necessary.

**Phase 3: Remediation**

**Design**

Where a Phase 2 identifies unacceptable risks a remediation strategy must be submitted which details the processes to be employed to remove or mitigate the risks.

**The remediation strategy should include:**

- The objectives of the remedial works;
- Details of the works to be carried out;
- Description of ground conditions (soil and groundwater);
- Type, form and scale of contamination to be treated;
- Remediation methodology;
- Site plans / drawings;
- Phasing of works and approximate timescales;
- Consents and licenses required (discharge consents, waste management licence, asbestos removal permits);
- Site management measures to protect neighbours.
- Contingencies to deal with any unexpected discoveries – including systems for notifying relevant authorities;
- Record keeping systems to be employed;
- Details of how works will be validated to ensure that remedial objectives have been met, including:
    - Sampling strategy;
    - Use of on–site observations, visual / olfactory evidence;
    - Chemical analysis;
    - Proposed remediation standards (including their derivation)
    - Details of any on-going monitoring that will be required e.g. gas and groundwater sampling strategies.

**Implementation and Verification**

Planning conditions will not normally be discharged until satisfactory validation information is received detailing remedial works undertaken.

**The verification report(s) should include:**

- Details of any sampling strategy carried out;
- Details of whom carried out the work;
- Details and justification of any changes from the original remediation strategy;

- Information on any unexpected discoveries or hotspots encountered and the steps taken to deal with them;
- Substantiating data, undertaken in accordance with current UK guidance and best practice, including where appropriate:
    - Laboratory and in situ test results, including analytical confirmation of any material utilised in remedial scheme, such as topsoil utilised in a cover system;
    - Ground gas and groundwater monitoring data, including an account of Radon gas;
    - Summary data plots and tables relating to clean up criteria;
    - Plans showing treatment areas and details of any differences from original remediation statement;
    - Waste management documentation – copies of consignment notes, receipts etc;
    - Confirmation that remedial objectives have been met;
    - Testing and verification, by a suitably qualified independent third party, of any installed ground gas protection measures;
    - Photographic evidence;
    - Technical specifications and detailed design plans.

## Annex 2 Standard WRS Contaminated Land Conditions

**Pre-commencement Conditions**

Pre-commencement conditions for contaminated land risk assessment are considered necessary for the following reasons:

- There is potential for contamination to exist on the site. The degree and extent of contamination is currently unknown. More information relating to ground conditions is required to determine whether or not remediation will be required (prior to any construction work commencing).

- Where remediation is necessary, this remediation may involve work/techniques that need to be completed before any development is commenced, for example the removal from site of contaminated soils/materials/underground structures, the design and incorporation of gas protection measures in any buildings etc. To carry out such work after construction has started/been completed, may require potentially expensive retro-fitting and in some cases the demolition of construction work already completed.

NPPF Paragraph 178 states; *"Planning policies should ensure that a site is suitable for its proposed use taking account of ground conditions, any risks arising from contamination, and any proposals for mitigation, including land remediation."* and *"After remediation, as a minimum, land should not be capable of being determined as Contaminated Land under Part 2A of the Environmental Protection Act 1990."*

**Tiered Investigation (Full)**

The history of the site suggests that contamination issues may potentially be a significant issue. As a result, in order to ensure that the site is suitable for its proposed use and accordance with The National Planning Policy Framework, Conditions are recommended below for inclusion on any permission granted.

The National Planning Policy Framework advises that Planning Decisions should ensure the site is suitable for its proposed use taking account of ground conditions, pollution arising from previous uses and any proposals for mitigation including land remediation. The Framework also requires adequate site investigation information be prepared by a competent person is presented. Little information is known or has been provided on this site and consequently a Phase I study is recommended.

**Condition - Tiered Investigation**

Unless otherwise agreed by the Local Planning Authority development, other than that required to be carried out as part of an approved scheme of remediation, must not commence until conditions 1 to 6 have been complied with:

1. A preliminary risk assessment must be carried out. This study shall take the form of a Phase I desk study and site walkover and shall include the identification of previous site uses, potential contaminants that might reasonably be expected given those uses and any other relevant information. The preliminary risk assessment report shall contain a diagrammatical representation (conceptual model) based on the information above and shall include all

potential contaminants, sources and receptors to determine whether a site investigation is required and this should be detailed in a report supplied to the Local Planning Authority. The risk assessment must be approved in writing before any development takes place.

2. Where an unacceptable risk is identified a scheme for detailed site investigation must be submitted to and approved in writing by the Local Planning Authority prior to being undertaken. The scheme must be designed to assess the nature and extent of any contamination and must be led by the findings of the preliminary risk assessment. The investigation and risk assessment scheme must be compiled by competent persons and must be designed in accordance with the Environment Agency's "*Land Contamination: Risk Management*" guidance.

3. Detailed site investigation and risk assessment must be undertaken and a written report of the findings produced. This report must be approved by the Local Planning Authority prior to any development taking place. The investigation and risk assessment must be undertaken by competent persons and must be conducted in accordance with the Environment Agency's "*Land Contamination: Risk Management*" guidance.

4. Where identified as necessary a detailed remediation scheme to bring the site to a condition suitable for the intended use by removing unacceptable risks to identified receptors must be prepared and is subject to the approval of the Local Planning Authority in advance of undertaking. The remediation scheme must ensure that the site will not qualify as Contaminated Land under Part 2A Environmental Protection Act 1990 in relation to the intended use of the land after remediation.

5. The approved remediation scheme must be carried out in accordance with its terms prior to the commencement of development, other than that required to carry out remediation, unless otherwise agreed in writing by the Local Planning Authority.

6. Following the completion of the measures identified in the approved remediation scheme a validation report that demonstrates the effectiveness of the remediation carried out must be produced, and is subject to the approval of the Local Planning Authority prior to the occupation of any buildings.

7. In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported in writing immediately to the Local Planning Authority. An investigation and risk assessment must be undertaken and where necessary a remediation scheme must be prepared, these will be subject to the approval of the Local Planning Authority. Following the completion of any measures identified in the approved remediation scheme a validation report must be prepared, which is subject to the approval in writing of the Local Planning Authority prior to the occupation of any buildings.

**Reason**

To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors.

**Ground Gas Assessment Required**

**Condition – Ground Gas Assessment**

(a) No development shall commence until an assessment of the risks posed by any ground gases or vapours has been submitted to and approved in writing by the Local Planning Authority. Such an assessment shall be carried out in accordance with current UK guidance and best practice.

(b) Where the approved risk assessment (required by condition (a) above) identifies ground gases or vapours posing unacceptable risks, no development shall commence until a detailed remediation scheme to protect the development from the effects of such ground gases or vapours has been submitted to and approved in writing by the Local Planning Authority. Following approval, such remediation scheme shall be implemented on site in complete accordance with approved details unless otherwise agreed in writing by the Local Planning Authority.

(c) Following implementation and completion of the approved remediation scheme (required by condition (b) above) and prior to the first occupation of the development, a verification report shall be completed in accordance with current UK guidance and best practice, and submitted to and approved in writing by the Local Planning Authority to confirm completion of the remediation scheme in accordance with approved details.

(d) No development shall commence until a long term monitoring and maintenance scheme (to include monitoring the long-term effectiveness of the remediation and reporting on the same), where required, has been submitted to and approved by the Local Planning Authority. The approved scheme must be carried out in accordance with its terms, recommendations and time tables. All further reports produced shall be submitted to and approved in writing by the Local Planning Authority, and then carried out in accordance with its terms, recommendations and time tables.

**REASON:** To ensure that the risk to buildings and their occupants from potential landfill or ground gases are adequately addressed.

**Ground Gas Assessment - Further information for applicant (to accompany condition)**

<u>Verification Requirements</u>

WRS recommend that the applicant is provided with the following additional information in relation to these conditions.

Verification is required to demonstrate that the site is suitable for use in terms of risks associated with ground gases. Verification of installed gas protection measures is necessary to demonstrate that installed gas protection measures are appropriate for the level of risk associated with the site, that they have been installed correctly and provide the required level of protection for the lifetime of the development.

The testing and verification of the installation of gas protection measures must be carried out in accordance with current guidance and best practice, namely:

- CIRIA C735 “Good practice on the testing and verification of protection systems for buildings against hazardous ground gases” and;

- BS8485:2015 “Code of practice for the design of protection measures for methane and carbon dioxide ground gases for new buildings”; and

Verification should always been carried out by an appropriate independent third party such as an experienced and suitably trained verification consultant or third party qualified and experienced installer. Examples include:

- assessors holding NVQ qualification in gas protection measures installation and/or NVQ qualification in verification of ground gas protection systems
- a suitably qualified and experienced geo-environmental consultant
- assessors accredited by the CL:AIRE Gas Protection Accreditation Scheme

Please refer to CIRIA C735 and BS8485:2015 for further information relating to verification requirements and minimum reporting requirements.

**Condition – Ground Gas Assessment OR installation of gas protection measures for low risk sites**

The application site is within 250m of a registered landfill site or significant area of unknown filled ground which has the potential to produce landfill gas from degradation processes. It is considered necessary to condition the application requiring the applicant to incorporate gas protection measures within the foundations of the proposed new structure; or to undertake a gas risk assessment to ascertain if gas protection measures are required. Consequently it is considered appropriate for the following condition to be applied to any permission granted:

a) Gas protection measures complying with Characteristic Situation 2 as set out in BS8485:2015 and CIRIA C665 as a minimum requirement must be incorporated within the foundations of the proposed structure(s). Following installation of these measures, and prior to the first occupation of the development, a verification report shall be submitted to and approved in writing by the Local Planning Authority.

***Or***

b) A risk assessment should be undertaken to establish whether the proposed development is likely to be affected by landfill or ground gas or vapours. The risk assessment must be provided to and approved in writing by the Local Planning Authority, prior to the commencement of development. The assessment shall be carried out in accordance with current UK guidance and best practice.

c) Where the approved risk assessment (required by condition (b) above) identifies ground gases or vapours posing unacceptable risks, no development shall commence until a detailed remediation scheme to protect the development from the effects of such ground gases or vapours has been submitted to and

approved in writing by the Local Planning Authority. Following approval, the remediation scheme shall be implemented on site in complete accordance with approved details unless otherwise agreed in writing by the Local Planning Authority.

d) Following implementation and completion of the approved remediation scheme (required by condition (c) above) and prior to the first occupation of the development, a verification report shall be completed in accordance with current UK guidance and best practice and submitted to, and approved in writing, by the Local Planning Authority to confirm completion of the remediation scheme in accordance with approved details.

**REASON:** To ensure that the risk to buildings and their occupants from potential landfill or ground gases are adequately addressed.

**Further information for applicant (to accompany condition)**

WRS recommend that the applicant is provided with the following additional information in relation to these conditions:

Typical Gas Protection Measures

Gas protection measures must be designed in accordance with current UK guidance and best practice. The type of gas protection measures required at a site will vary depending on the specific circumstances of the site in question. Typical gas protection measures complying with Characteristic Situation 2 in CIRIA C665 are outlined below for information.

**The applicant should have regard to current UK guidance and best practice before designing and installing any gas protection measures.**

Measures typically complying with Characteristic Situation 2 as outlined in CIRIA C665 are as follows:

For Residential Development:

- Reinforced concrete cast in situ floor slab with at least 1200 g DPM and underfloor venting *or*
- Beam and block or pre-cast concrete and 2000 g DPM/reinforced gas membrane and underfloor venting.
- All joints and penetrations sealed.

For Commercial Development:

- Reinforced concrete cast in situ floor slab with at least 1200 g DPM and underfloor venting *or*
- Beam and block or pre-cast concrete and 2000 g DPM/reinforced gas membrane and underfloor venting.
- Possibly underfloor venting or pressurisation in combination with the above, depending on use.
- All joints and penetrations sealed.

Please refer to BS8485:2015 "Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings" and CIRIA C665 (2007) "Assessing risks posed by hazardous ground gases to buildings" for further information.

**Verification Requirements**

Verification is required to demonstrate that the site is suitable for use in terms of risks associated with ground gases. Verification of installed gas protection measures is necessary to demonstrate that gas protection measures are appropriate for the level of risk associated with the site, that they have been installed correctly and provide the required level of protection for the lifetime of the development.

The testing and verification of the installation of gas protection measures must be carried out in accordance with current guidance and best practice, namely:

- CIRIA C735 "Good practice on the testing and verification of protection systems for buildings against hazardous ground gases; and
- BS8485:2015 "Code of practice for the design of protection measures for methane and carbon dioxide ground gases for new buildings"

Verification should always been carried out by an appropriate independent third party such as an experienced and suitably trained verification consultant or third party qualified and experienced installer. Examples include:

- assessors holding NVQ qualification in gas protection measures installation and/or NVQ qualification in verification of ground gas protection systems

- a suitably qualified and experienced geo-environmental consultant
- assessors accredited by the CL:AIRE Gas Protection Accreditation Scheme

Please refer to CIRIA C735 and BS8485:2015 for further information relating to verification requirements and minimum reporting requirements.

**Landfill near extensions - Informative for an extension within 250m of landfill or significant area of unknown filled ground:**

The above site has been reviewed for any potential contamination issues. The proposed development is sited within 250m of a registered landfill or significant area of unknown filled ground which potentially could produce landfill gas.

The applicant is advised to consider incorporating matching landfill gas protection measures within the foundations of the proposed extension(s), so as not to compromise any existing gas protection measures which may have been installed in the existing building. If the existing building has no protection measures currently there is no need to install gas protection measures within the proposed extension.

**Reason**

To ensure that the risks to buildings and their occupants from landfill sites are adequately addressed.

**Imported soil or soil forming materials**

**Imported soil condition**

The application details suggest that soil or soil forming materials will be required to be imported on to the site. As a result, in order to ensure that the site is suitable for its proposed use and accordance with The National Planning Policy Framework, Conditions are recommended below for inclusion on any permission granted.

The National Planning Policy Framework advises that Planning Decisions should ensure the site is suitable for its proposed use. The Framework also requires adequate information be prepared by a competent person is presented.

**Condition - Import of soil and soil forming materials**

Full details of any soil or soil forming materials brought on to the site for use in garden areas, soft landscaping, filling and level raising must be provided. Where the donor site is unknown or is brownfield the material must be tested for contamination and suitability for use on site. Full donor site details, proposals for

contamination testing including testing schedules, sampling frequencies and allowable contaminant concentrations (as determined by appropriate risk assessment) must be submitted to and approved in writing by the Local Planning Authority prior to import on to the site.

The approved testing must then be carried out and validatory evidence (such as laboratory certificates) submitted to and approved in writing by the Local Planning Authority prior to any soil or soil forming materials being brought on to site.

**Reason**

To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors.

**Unexpected Contamination**

**Condition - Reporting of Unexpected Contamination**
In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported immediately to the Local Planning Authority. The applicant is advised to immediately seek the advice of an independent geo-environmental consultant experienced in contaminated land risk assessment, including intrusive investigations and remediation.

No further works should be undertaken in the areas of suspected contamination, other than that work required to be carried out as part of an approved remediation scheme, unless otherwise agreed by the Local Planning Authority, until requirements 1 to 4 below have been complied with:

1. Detailed site investigation and risk assessment must be undertaken by competent persons in accordance the Environment Agency's "*Land Contamination: Risk Management*" guidance and a written report of the findings produced. The risk assessment must be designed to assess the nature and extent of suspected contamination and approved by the Local Planning Authority prior to any further development taking place.

2. Where identified as necessary, a detailed remediation scheme to bring the site to a condition suitable for the intended use by removing unacceptable risks to identified receptors must be prepared and is subject to the approval of the Local Planning Authority in advance of undertaking. The remediation scheme must ensure that the site will not qualify as Contaminated Land under Part 2A Environmental Protection Act 1990 in relation to the intended use of the land after remediation.

3. The approved remediation scheme must be carried out in accordance with its terms prior to the re-commencement of any site works in the areas of suspected contamination, other than that work required to carry out remediation, unless otherwise agreed in writing by the Local Planning Authority.

4. Following completion of measures identified in the approved remediation scheme a verification report that demonstrates the effectiveness of the remediation carried out must be produced, and is subject to the approval of the Local Planning Authority prior to the occupation of any buildings on site.

**REASON**

To ensure that the risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecosystems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors.

# 5. Noise & Vibration Technical Guidance

## 5.1 Policy Context

**National Planning Policy Framework 2018**

The National Planning Policy Framework (NPPF) sets out the Government's policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities. Guidance concerning noise is provided in Paragraph 180 of the NPPF.

**Paragraph 180 of the NPPF**

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

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

*The explanation of significant adverse impact and adverse impacts are provided in the Explanatory Note for the Noise Policy Statement for England (see below).*

**Noise Policy Statement for England 2010**

In March 2010 the Government issued a Noise Policy Statement for England (NPSE). The aim of this document is to "provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion."

The NPSE includes three primary aims

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life

The NPSE sets out the long-term vision for Government noise policy through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The NPSE categorises noise exposure into “no observed effect level”, “significant adverse” and “adverse” These concepts have been developed by the World Health Organisation and they follow established concepts from toxicology to noise impacts:

- **NOEL** – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

- **LOAEL** – Lowest Observed Adverse Effect Level This is the level above which adverse effects on health and quality of life can be detected. The NPSE expands these terms leading to the concept of a Significant Observed Adverse Effect Level.

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

The NPSE goes on to state that it is not possible to have a single objective noise-based measure that defines SOAEL that will be applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times.

**Values of SOAEL and LOAEL** In the absence of nationally published and agreed values for SOAEL and LOAEL for residential properties Worcestershire Regulatory Services (WRS) have derived these values from recognised sources and existing Local and European standards for the protection of human health.

## 5.2 WRS Application of National Policy (NPPF)

General Statement

Noise sensitive developments such as residential should not be exposed to high levels of ambient noise from future development proposals.

Noise sensitive developments will be discouraged in areas that satisfy the criteria for the preparation of noise action plans.

Throughout the planning process applicants should be encouraged to consult all relevant partners to ensure the best use is made of land whilst minimising noise impacts.

Developers should:

- Maximise the distance between noise sources and noise-sensitive uses.
- Use landscaping and non noise-sensitive uses to provide screening to noise-sensitive areas
- Carefully consider the implications arising from the existing night-time use of the locality.

## 5.3 WRS Application of NPSE Aims

The following recommendations are made by WRS to support the aims of the NPSE

**1st Aim**

- Significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (NPSE paragraph 1.8).

- This aim is underpinned by the NPPF which states that "planning policies and decisions should avoid noise giving rise to significant adverse impacts on health and quality of life".

**To support this aim WRS will normally advise the LPA that they should consider refusal of applications where the noise impact on sensitive receptors exceeds the SOAEL.**

**2nd Aim**

- Noise Policy Statement for England aims to mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development. This refers to the situation where the noise impact lies somewhere between **LOAEL** and **SOAEL**. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (NPSE paragraph 1.8). This does not mean that development cannot take place where such adverse effects will occur.

- This aim is reflected by the NPPF which states that "planning policies and decisions should mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions".

**To support these aims WRS will normally advise that the LPA should consider imposing conditions to mitigate noise impacts where noise levels exceed the LOAEL but are less than the SOAEL.**

**3rd Aim**

- Noise Policy Statement for England seeks, where possible, to positively improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development (NPSE paragraph 1.8), recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.

**WRS will normally advise that the LPA should consider imposing conditions or refusal of developments where the noise impact is so significant that it would detrimentally transform the noise characteristics of identified quiet areas.**

## 5.4 Application of Technical Standards and Relevant Guidance

| Reference Document | Summary |
|---|---|
| Guidelines for Community Noise<br><br>World Health Organisation 1999 | The Guidelines for Community Noise have been prepared as a practical response to the need for action on community noise at the local level, as well as the need for improved legislation, management and guidance at the national and regional levels. It provides criteria for the assessment of the acoustic environment for a variety of situations. |
| Night Noise Guidelines for Europe<br><br>World Health Organisation 2009 | This document presents the conclusions of the WHO working group responsible for preparing guidelines for exposure to noise during sleep. This document can be seen as an extension of the WHO Guidelines for community noise. |

| | |
|---|---|
| British Standard 8233:2014 ‘Sound insulation and noise reduction for buildings – Code of Practice’ | This Code of Practice provides guidance on the design of buildings that have internal acoustic environments appropriate to their functions. It includes design criteria and deals with the control of anonymous noise from outside the building and noise from plant and services within. |
| British Standard 4142:2014 ‘Method for Rating industrial noise affecting mixed residential and industrial areas’ | This standard is intended to be used for assessing the measured or calculated noise levels from both existing premises and new or modified premises, for noise of an industrial nature. It recognizes that the standard may be helpful in certain aspects of environmental planning and may be used in conjunction with recommendations on noise levels and methods of measurement published elsewhere |
| British Standard 6472-1:2008 ‘Guide to evaluation of human exposure to vibration in buildings’ | This standard provides guidance on predicting human responses to vibration in buildings and includes advice on measurement methods to be employed. Methods of assessing continuous, intermittent and impulsive vibration are presented. |
| Building Bulletin 93: ‘Acoustic Design of Schools’ | This document provides acoustic design criteria for schools and has been referenced in this document particularly with regard to criteria to ensure that schools are not subject to unacceptable levels of external noise. |
| Institute of Acoustics Good Practice Guide on the Control of Noise from Pubs and Clubs. | This document provides guidance for the assessment and control of noise affecting noise-sensitive properties from public houses and clubs, and other premises holding similar events. The main noise sources considered are music, singing and public address systems as well as noise from other ancillary activities. |
| Department of Health ‘Health Technical Memorandum 08-01 Acoustics’ | This document provides acoustic design criteria for healthcare premises and has been referenced in this document particularly with regard to criteria to ensure that hospitals are not subject to unacceptable levels of external noise. |

## 5.5 WRS Integration of National Guidance & NPSE – Values of SOAEL and LOAEL

For residential properties

SOAEL and LOAEL values for residential properties have been derived for common noise sources. These are included in the table below. The criteria selected will depend upon the specific proposal (i.e. new residential development or introduction of a noise source to existing residential development).

The table below shows values of SOAEL and LOAEL for common noise sources:

| Noise source | Assessment Location | LOAEL | SOAEL | Times |
|---|---|---|---|---|
| General environmental noise, road traffic, rail traffic/Mineral workings | Outdoor living space | 50 dB LAeq,16hr (A)(D) | 55 dB LAeq,16hr (D) | Day 07:00 – 23:00 |
| | Living Room | 35 dB LAeq,16hr (C) | | Day 07:00 – 23:00 |
| | Dining Room | 40 dB LAeq,16hr (C) | | Day 07:00 – 23:00 |
| | Bedroom | 35 LAeq,16hr (C) | | Day 07:00 – 23:00 |
| | Bedroom | 30 LAeq,8hr (C)<br>45dBLAFmax(C) | | Night 23:00 – 07:00 |

References in superscript (A – D) are defined on the following pages

## 5.6 Anonymous Noise Sources – General Environmental Noise/Transportation Noise/Mineral Workings

### A

The most widely observed effect is community annoyance. The World Health Organisation[1] (WHO) suggest that to protect the majority of people from moderate annoyance during the day time outdoor noise levels should not exceed $50dB_{LAeq}$. This should be considered as the LOAEL for residential development subject to transportation noise. At sites where daytime levels from transportation noise are less than $50dB_{LAeq}$ noise will not be a consideration.

Where the external noise is $50dB_{LAeq}$ internal noise levels (open windows) will be acceptable (35-$40dB_{LAeq}$).

### B

Night time noise limits: The over riding concern is to prevent sleep disturbance. The WHO published their finding on the impact of night time noise in 2009[2]. Table 5.4 in the WHO night time noise guidance summarises much of the findings. At levels below $30dBL_{night,outside}$ there are no observed effects and this may be considered the NOEL. When levels increase to $40dBL_{night,outside}$ adverse effects are observed. It should be noted in addition to a steady level effects were also observed for transient events where maximum levels exceeded $42dBL_{AFmax,inside}$, It is suggested that for sleep disturbance the LOAEL is $45dBL_{night,outside}$, and $45dBL_{AFmax,inside}$ (i.e. 55 $dBL_{AFmax,outside}$ with open windows). When external levels increase above this level it will be necessary to close the windows and provide alternative ventilation to ensure that the internal noise levels continue to be acceptable. Research carried out in Sweden suggests that where external noise levels exceed 42-$46L_{Aeq(22:00 – 06:00)}$ fewer people sleep with their windows open (WHO[2] figure 1.7). With consideration given to the attenuation provided by the structure of the dwelling this would equate to approximately 35dB providing attenuation (windows closed) up to an imperical value of 67$dBL_{night, outside}$ at the façade. This is considered the SOAEL for external noise levels for dwellings without outdoor amenity areas that also have mechanical ventilation provisions.

### C

The values provided in the guidance in WHO[3] Table 4.1can be considered to be the SOAEL within habitable rooms.
These WHO values have been adopted into BS 8233:2014 [4](7.7.2 Table 4) together with more specific room classification.

### D

WHO[3] report that to prevent the majority of people becoming seriously annoyed during the daytime the sound pressure level *on functional balconies, terraces and outdoor areas intended as designated amenity areas* should not exceed 55dB $L_{Aeq}$. This should be considered the SOAEL for gardens and outdoor living spaces and the LOAEL as 50dB $L_{Aeq}$ .

**N.B.** Determination of exemptions under the criteria of "desirable development" in Paragraph 7.7.3.2 of BS8233:2014 is not within WRS remit. Sites that do not comply with the LOAEL/SOAEL standards but fulfil the criteria of desirable development will be referred to the LPA for the purpose of classification.

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*[1] Guidelines for Community Noise Edited by B. Berglund et al WHO 1999 (paragraph 4.3.1)*

*[2] Night Noise Guidelines for Europe WHO 2009*

*[3]Guidelines For Community Noise WHO 1999*

*[4]BS 8233:2014*

## 5.7 Other Noise Sources (identifiable)

The values of SOAEL and LOAEL given in Section 6 were derived for anonymous noise sources such as road and rail traffic. For identifiable specific sources there is less published research on their impact. Possible methods include the following:

The comparison of the source level to the ambient (or background noise level) will take account of the existing acoustics environment. This methodology is described in BS 4142:2014. WRS acknowledge that the derivation of LOAEL/SOAEL values is not appropriate for all environmental circumstances particularly where existing noise levels in urban areas is of such significance that additional noise sources may well be indistinguishable. The following Table sets out the WRS recommendations when dealing with identifiable sources[5]:-

| Noise Source (Identifiable) | Environmental Classification | Background Noise Level | Rating Level |
|---|---|---|---|
| Commercial noise or noise of a industrial nature (not anonymous)<br><br>**Note** criteria selected will depend on both nature of the source and the assessment location | Rural | < 30dB(A) $L_{90\ (23:00 – 07:00)}$<br><38dB(A) $L_{90(07:00 – 23:00)}$ | -10 (or less) |
| | Semi Rural | >30dB(A) $L_{90\ (23:00 – 07:00)}$<br><45dB(A) $L_{90(07:00 – 23:00}$ | 0(or less) |
| | Urban | <38dB(A) $L_{90\ (23:00 – 07:00)}$<br>>48dB(A) $L_{90(07:00 – 23:00)}$ | +5(or less) |

Whilst this is intended for noise of an industrial nature it can provide a basis for assessing other noise sources, for example music or entertainment noise which usually includes a significant quantity of bass can be assessed by undertaking a similar analysis in octave (or third octave) bands.

[5]*WRS best practice application for the purpose of protecting noise amenity*

## 5.8 Noise Assessments

**Submission of Noise Assessments**

Noise assessments should be submitted to WRS for consideration in support of planning applications where proposed or existing noise sensitive occupiers may be affected by proposed or existing noise sources as a result of the development. **They should be carried out by a competent person who has appropriate training and experience in the field of environmental acoustics.**

In some cases a noise assessment may simply show by predictive calculation that a proposal will have no noise implications, and in others a detailed and complex study with proposals for further mitigation measures may need to be considered and the effectiveness analysed. WRS work closely with their partners where such proposals may materially affect the application (e.g. a high acoustic barrier may not be acceptable on visual grounds).

**Assessment Requirements**

Key requirements for noise assessment reports include:

- A clear plan indicating locations of noise sources, sensitive receptors, measurement positions and any mitigation measures if appropriate
- Consideration of worst case scenarios (e.g. averaged values for $L_{Aeq,T}$ or $L_{A90,T}$ will not normally be accepted and background noise measurement times must be representative of quieter periods whilst noise generating activities are ongoing)[6].
- Measurement time periods for noise indices should be appropriate to the location and situation. This guidance stipulates time periods for some circumstances, which should be used unless there are specific circumstances why they are not appropriate (which should be stated, and preferably agreed with WRS).
- An indication of uncertainty or errors associated with measurements or assessment must be included.
- Where mitigation is necessary for a development to satisfy noise criteria provided in this report the report should include a full specification of the mitigation. For example barrier height, location or location(s) maximum sound power level(s) for items of plant.
- Use of mitigation schemes and calculations must be appropriate for the noise source.(e.g. utilising a noise bund calculation in CRTN for an industrial point

[6] *Arithmetic averaging is not generally appropriate for noise indices. WRS will however accept averaged values of $L_{A10,1hr}$ in accordance with the procedure in Calculation of Road Traffic Noise.*

source with discrete low frequency noise components is not appropriate).

- Assessments containing mitigation proposals must have 'real world' application and assessments that have been 'fixed/fitted' to comply with standard criteria using borderline values e.g. 54.9dB(A) on 55dB(A) criteria will be considered insufficient.
  Further general guidance on the contents of a noise assessment report can be found in ***Appendix II***. If an applicant is in any doubt as to the need for, or any requirements of, a noise assessment then this should be discussed with the WRS.

**Criteria for external and internal noise levels**

Design documents generally specify acceptable noise levels within the building. Where there is a need to specify an external noise level then it is recommended this be done by adding 10 dB to the internal criteria. This adjustment is based on the assumed noise reduction of a partially open window.

**How to deal with multiple site / façade standards**

Where two or more performance criteria apply for a point on a site or façade then the highest standard of noise mitigation shall be applied. If in doubt the developer should seek advice from the WRS.

**Consideration of local noise sources**

In order to better guide the decision making process it is important to know what noise sources exist in the locality of a proposed development and also the extent of their impacts (e.g. operating hours of source premises). Consideration should also be given to presenting the impact of each source on the development and including details of any remedial measures proposed to reduce the impact.

The onus for gathering this information will lie with the applicant as part of a full and comprehensive acoustic survey (See Appendix II).

Where this is not undertaken this may result in WRS identifying information which could impact upon the application under consideration and this could result in an unfavorable recommendation made to the Local Planning Authority or lead to time consuming discussions and further work on behalf of the applicant.

It is therefore in the interests of all parties that suitable time be set aside for the acoustic survey to ensure it is as comprehensive as possible.

**Measurement of internal noise levels**

Internal noise levels in residential dwellings can be very low, particularly late at night and in the early hours of the morning when entertainment venues may still be operating. In some cases the noise levels may be significantly below the lower measurement limits of the instrumentation used to measure the noise. Care must be taken to ensure that the measured noise levels are not influenced by the noise floor of the instrumentation used. Advice should be sought from WRS if

necessary.

**Post Completion Reporting**

Where applicable post completion reports will be expected to meet the noise mitigation report that was accepted by WRS and the LPA. WRS will refrain from approving reports that do not comply with designed noise mitigation objectives or demonstrate noise control performance that is unfeasible.

**Instrumentation**

Instrumentation used for undertaking field measurements should be integrating Type 1 specification and compliant with IEC 61672 : 2003 & IEC 60942 : 2003. The measurement system should be accompanied with a valid UKAS certification of compliance in accordance with BS 7580 part 1 and be available on request. Vibration instrumentation must be compliant with BS EN ISO 8041:2005.

**Rejection of Noise Assessments**

WRS will reject or dismiss elements of noise assessments for the following reasons: -

- Local circumstances have changed since the report/measurements were undertaken
- Insufficient assessment of noise impact/ inappropriate use of standards in the assessment
- Unrepresentative measurement periods for the assessed impact
- Use of uncalibrated old or outdated instrumentation
- Failure to supply 'working out' of calculated/predictive values
- Use of standards or indices that are outdated or inappropriate
- Incorrect use of extrapolative measurement techniques
- Incorrect or inappropriate interpretation or application of standards
- Noise assessments that are considered flawed or where WRS suspect misrepresentation and believe that any mitigation proposals will not realistically deliver the declared outcome. (WRS may advise LPA of this)
- Application of guides, interpretations, processes and standards that fall outside of WRS own guidance e.g. CIEH Professional Practice Guidance on Planning & Noise (ProPG)

## 5.9 Proposed Developments Containing Noise Generating Uses

**Introduction**

Where applications contain noise sources which may have an impact upon existing noise-sensitive uses, the applicant will be required to provide supporting information to allow this impact to be evaluated, in line with the provisions of this section. For the purposes of this document noise sensitive premises are taken to be places where the building occupants may be resting, sleeping or studying, or spending recreational time. This includes residential premises, hotels, hospitals and schools. Noise sources including plant, deliveries, car parking originating from hospitals, schools and hotels shall be assessed using the guidelines in this section.

**General Noise Sources**

For the majority of general noise sources an assessment should be carried out at the façade of noise sensitive premises to demonstrate that the criteria in section 7 is met.

The noise level of the source shall be reported as $L_{Aeq,T}$ where T shall normally follow the guidance in BS 4142 (1 hour for daytime and 15 minutes for night time). Where a single cycle of a night time operation exceeds 5 minutes the $L_{Aeq}$ for a complete cycle shall be measured.

Remember noise characteristics and levels can vary substantially according to their source and the type of activity involved. In the case of industrial development for example, the character of the noise should be taken into account as well as its level.

Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone may require special consideration.

Where two or more performance criteria apply at a receptor on a site or façade then the more stringent criteria shall apply. If in doubt the developer should seek advice from WRS.

Where specific noise sources do not lend themselves well for assessment under this section WRS may recommend the use of alternative criteria.

**Measurement of background and ambient noise levels**

- Background and ambient noise levels shall be representative of the existing noise levels at the most sensitive time during or immediately before or after the proposed period(s) of operation.

- Where different operating regimes are proposed (for example daytime, evening and night time) background and ambient noise levels shall be determined for each operating period.

- For most developments a 20 minute measurement of background noise will not normally be sufficient.

**Speculative developments**

Some planning applications contain very little information on which an assessment of the potential noise impact can be based. This is common for outline planning applications but is also an issue with some full applications where there is little information about the likely end-use, for example with speculative commercial developments.
In such circumstances, to ensure that the amenity of residents of nearby noise sensitive premises is safeguarded, WRS will make an assessment based on the likely worst case scenarios with respect to noise impact. This may lead to WRS recommending that the LPA subject the application to a large number of conditions to address all foreseeable situations. Clearly the more detail that is provided by the applicant, the more WRS will be able to limit uncertainties and thereby reduce the number of conditions required.

In circumstances where, even with reasonable mitigation measures, the development is unlikely to satisfy the requirements of this document then WRS may recommend that the LPA may wish to refuse such applications.

**General sound insulation criteria**

Where a development containing the noise source(s) is attached to noise sensitive premises, for example in the case of a parade of shops with flats above, the applicant shall submit a scheme of noise insulation to demonstrate that the following criteria would be met:

• In all cases sound insulation between the two uses shall be at least 60dB $D_{nT,w}$.

• For some applications it may be necessary to undertake a noise assessment to demonstrate that the level of inside the noise sensitive premises arising from the activities in the noise generating premises ($L_{eq,5min}$) will be at least 10dB below the indoor ambient noise level ($L_{eq,5min}$) in octave bands over an appropriate frequency range.

In both instances it is advisable that the applicants contact WRS for advice.

Consideration should also be given to structure borne noise and vibration from machinery, fixed plant and ventilation systems, and from footfall, the opening and closing of doors, etc.

For vibration the guidance in Section 10 shall be followed.

**Quiet areas and amenity space**

Worcestershire has no areas affected by the Environmental Noise (England) Regulations 2006 as of publication.

However it is expected that careful consideration should be given to areas identified as having very quiet background noise that are persistently <30dB(A)$L_{90}$ at night or areas that are generally considered tranquil where the introduction of a new noise source would significantly change the noise characteristics of the area.

Development proposals will therefore be expected to be sympathetic and in keeping with the general noise climate of the area.
It will also be necessary to demonstrate that the proposed development does not overtly conflict with any nearby amenity space, for example gardens, parks, sports fields, canal towpaths etc.
In preparation of noise reports it is advised that consultants should contact WRS in advance/during the undertaking of any assessments to discuss such sensitive locations.

**Specific criteria for schools and hospitals**

The design of schools and hospitals is covered within specific technical documents, which contain a large number of design criteria for the differing types of rooms. Schools are covered within Building Bulletin 93 and the criteria are reproduced in Appendix IV of this document.
Hospitals are covered within Health Technical Memorandum 08-01 and the criteria are reproduced in Appendix V of this document.

Where applications are received for schools or hospitals WRS will not specify any noise levels to be met at the planning stage. WRS will recommend that consideration be given to the levels within the relevant document as a comment attached to the planning consultation response but this will be unlikely to be in the form of an actual condition.

**Specific Criteria for Hotels**

The location and construction of a hotel will normally be based on a business case. The WRS will not prescribe noise and vibration criteria for hotel bedrooms. We recommend that hotel bedrooms shall be designed and located such that the unoccupied noise levels do not exceed the criteria specified BS8233:2014.

Similarly we recommend that hotel bedrooms shall be designed and located such that vibration levels do not exceed 0.14 mm/s peak particle velocity or the assessment of vibration levels results in a low probability of adverse comment when assessed in accordance with BS 6472.

**Energy Generation & Waste Management**

**Wind Farms/Turbines**

WRS will generally follow the principles of ETSU-R-97 however we are of the view that this guide has short comings. For this reason WRS will also seek guidance from research and field findings and will treat each application on its own merit due to the 'amplitude modulation' phenomena that is currently unaccounted for in existing guidance.

Other energy generation facilities may be subject to assessment in accordance with BS 4142:2014.

**Quarrying & Mineral Workings**

When assessing the noise impact of proposed new and existing workings WRS will require assessments to take into consideration noise assessment techniques such as BS4142:2014 which are technically superior to existing mineral working guidance on noise which are considered outdated for the purposes of assessing the impact of noise upon nearby communities.

## 5.10 Vibration

**Introduction**

Although vibration issues are not encountered frequently in the planning process it is something that should be considered where the development would lead to vibration sensitive premises being in close proximity to industrial/commercial activities or to railway lines. Because of the uncertainties involved in predicting vibration effects each case will be considered individually, and appropriate criteria agreed. In all appropriate cases the applicant is encouraged to contact WRS at the earliest opportunity to discuss vibration issues.

**Vibration from railway traffic**

For existing buildings within 30m of a railway line where change of use to residential use is proposed a vibration survey within the building should be carried out. For new-build developments within 30m of a railway line a vibration survey must be carried out on the building lines closest to the railway. It will be important to

survey at times when the highest levels of vibration are likely to occur, and it should be noted that a number of railway routes in the north of Worcestershire carry freight traffic at night.

For small developments (for example a single house or semi-detached pair) within 30m of a railway line WRS may undertake a limited, daytime, vibration survey at the proposed development site. In situations where these measurements suggest a potential problem then the applicant may be required to undertake a more detailed study.

**Vibration surveys**

In circumstances where vibration is a potential source of disturbance it is expected that an appropriate vibration survey or prediction be carried out. Initially, to avoid complex investigations being carried out unnecessarily a screening survey should be carried out. If monitored vibration levels do not exceed 0.14 mm/s peak particle velocity in any axis then no further survey is necessary. If this level is exceeded then it is expected that an assessment would be carried out with reference to BS6472. Where re-radiated noise is a potential problem then this should also be assessed. Data from these assessments should be made available to WRS for consideration.

# Annex 1 Glossary of Terms

'**A' weighting (dB(A)):** A frequency dependent correction which weights sound to correlate with the sensitivity of the human ear to sounds of different frequencies.

**Ambient Noise:** A measure of the typical noise (excluding any unusual events) present at a site. This is usually described in terms of *L*Aeq,T.

**Anonymous noise:** Noise that cannot be attributed to a single (specific source). For example noise from cars on a road would be considered anonymous whereas a noisy ventilation unit would not.
**Audible:** Sound that can be heard or is perceptible by the human ear.

**Background Noise**: A measure of the underlying noise (excluding any unusual events) which is present at a site before a new noise source is introduced. This is usually described in terms of the *L*A90 level: the sound pressure level exceeded for 90% of the time.

***C*tr Spectrum adaptation term:** A correction added to a sound insulation quantity (such as *R*w) to take account of a specific (traffic noise) spectra. See BS EN ISO 717-1:1997. For example the difference between internal and external traffic noise levels in dB(A) is calculated using ***R*W + *C*tr** (equivalent to ***R*tra)**

**Clearly audible:** There is no acoustic definition for clearly audible and as such a noise source may be deemed to be clearly audible if it is both easily identifiable and deemed likely to adversely affect the amenity of residents of any (proposed) development.

**DMRB:** The "Design Manual for Roads and Bridges" (DMRB) was introduced in 1992 in England and Wales. The DMRB sets a standard of good practice that has been developed principally for Trunk Roads. It may also be applicable in part to other roads with similar characteristics. (Volume 11, Section 3, Part 7 covers Noise and Vibration, see http://www.standardsforhighways.co.uk/dmrb/index.htm)

***D*ne,W Weighted element normalized level difference:** A single-number quantity which characterizes the airborne sound insulation of a small building element. See BS EN ISO 717-1: 1997

***D*n*T*,W Standardised level difference:** A single-number quantity which characterizes the airborne sound insulation between rooms. See BS EN ISO 717-1: 1997

**Decibel (dB):** A unit used for many acoustic quantities to indicate the level of sound with respect to a reference level.

**WRS:** Worcestershire Regulatory Services Environmental Health, Trading Standards & Licensing, PO BOX 866, Worcester. WR1 9DP.

**Façade measurement:** Noise measurements made outside an external wall of a structure (usually 1 metre from the wall).

**Habitable room:** A room used for sleeping or recreation/relaxation/study.

**Inaudible:** Sound that cannot be heard or is imperceptible to the human ear.

**Industrial-type noise sources:** Noise sources that are industrial in character. For example noise from plant and machinery, materials handling operations, or maneuvering of heavy vehicles.

**Institute of Acoustics:** A professional body representing persons at all levels working in the field of acoustics. *http://www.ioa.org.uk/*

**LA90,T:** Sound pressure level exceeded for 90% of the measurement period "T" or 'background level'.

**LAeq,T:** Equivalent continuous sound pressure level measured over the time period "T"

**LAmax:** The maximum RMS A weighted sound pressure level

**Mixed Use:** Premises or development which will include both residential and non-residential uses

**Noise:** Unwanted sound.

**Noise Action Plans and Quiet Areas:** The Environmental Noise Directive 2002/49/EC (END) and the Environmental Noise (England) Regulations 2006 (as amended) require UK government to:

Prepare strategic noise maps for large urban areas (referred to as agglomerations in the Directive), major roads, major railways and major airports.

**Noise assessment:** Evaluation of noise climate and impacts by a suitably qualified person to assist in the determination of a planning application.

**Noise-sensitive premises / developments:** Principally comprising residential premises, hospitals, schools and hotels. Other premises types may be deemed such depending upon circumstances.

**Noise Nuisance:** A legal term used to describe noise at a level that is disturbing as perceived by a reasonable person. The meaning of nuisance is defined by precedent in common law.

**Outdoor Amenity Area:** An outdoor area adjacent to a residential building which is designed and intended primarily for the

leisure and recreation of the occupants of the dwelling. This will include gardens, landscaped areas, balconies.

***R*, Sound reduction index:** A quantity which characterizes the airborne sound insulation of a material or building element in a stated frequency band. See BS EN ISO 140-3:1995

***R*W, Weighted sound reduction index:** A single-number quantity which characterizes the airborne sound insulation of a material or building element measured in the laboratory. See BS EN ISO 717-1: 1997

**Rating Level:** The noise level of an industrial noise source which includes an adjustment for the character of the noise. Used in BS4142.

**Sound insulation:** A quantity which is used to characterize the reduction in sound pressure level across an element or partition. (See ***R, R*W, *D*n*T*,W, *D*n*e*,W, *C*tr**)

**Structure borne noise:** Noise that propagates via a structure, for example transmitted vibration in building elements then re-radiated as noise.

**Suitably qualified person:** A person having a suitable combination of formal training and experience in the assessment of noise. Advice in the identification of suitably qualified persons can be obtained from the Association of Noise Consultants. *http://www.association-of-noise-consultants.co.uk/*

## Annex 2 – Criteria for the content of Noise Assessments

It should be noted that noise assessment is a skilled operation and should be undertaken only by persons competent in the procedures.

**Introduction**

Outline the purpose and scope of the report

Include the site address or other location details (e.g. land adjacent to 123 Any Road….)

**Methodology**

Detail any standards / policies to be used and give a brief outline of why they have been chosen

Provide more detail and justifications why accepted standards have not been used where applicable

Outline the process to be followed

**Noise measurements**

Detail the location, dates and times of all measured data relied upon and provide summaries of the results obtained.

If it has not been possible to measure at the actual location of the proposed development, state why an alternative location is considered representative.

Provide explanations for any abnormal or anomalous results
Give brief details of the equipment used and a confirmation that it has been verified within an appropriate time (usually bi-annually) and that appropriate site calibration checks were carried out. Note that all equipment used should comply with appropriate standards (e.g. IEC 61672 or its predecessors [for Sound Level Meters])

Detail the meteorological conditions during the monitoring period

i. Wind speed
ii. Wind direction

iii. Temperature
iv. Precipitation

Note: It will generally be acceptable to state that meteorological conditions were satisfactory for measurement purposes and only provide more detail if they are borderline.

**Predictions**

Where it has been necessary to predict noise levels, brief explanations of how these have been derived including any assumptions made (e.g. downwind propagation) and what standard have been followed (e.g. CRTN, ISO 9613)

If a software package has been used, a brief description of it (e.g. Lima, Cadna, NoiseMap, SoundPlan) brief details of the geographical and source data used details of any validation checks carried out

**Assessment**

Give details of the assessments made based on the measured and/or predicted data. State any assumptions made.

Show any calculations made to sufficient detail that they could be checked for accuracy. If the calculations are complicated, the details may be included as an appendix.

**Mitigation**

Give details of any mitigation measures that are / may be required and the anticipated effect

i. Enhanced glazing and doors
ii. Reorientation of buildings
iii. Barriers or bunds
iv. Alternative plant or machinery

**Recommendations**

Detail what steps should be taken by the developer to meet the relevant criteria

i. Glazing specification
ii. Ventilation specification & Suitability

iii. Heights, locations and specifications of barriers or bunds
iv. Appropriate technical specifications for plant or machinery (e.g. refrigeration compressors, extract systems)
v. Any other data required by the developer to meet the required noise standards /guidance

**Conclusions**

A brief resume of the process described above and a confirmation that if the recommendations are carried out satisfactorily that appropriate standards / guidance will be complied with.

**Appendices**

Scale plans showing the site location and the location of any measurement or prediction positions in sufficient detail to enable them to be readily identified. Aerial photos from online mapping sources may be useful.

Unabridged noise monitoring / measurement results on which the assessment is based.

Details of any calculation(s) relied upon.

## Annex 3 – Internal Noise Levels for New School Build

| Criterion | Room Type/Activity | Specified Level |
|---|---|---|
| Reasonable Listening/Study and Work | **Music Rooms**<br><br>**Large lecture rooms > 50 people**<br><br>**Drama Rooms** | 30 dB $L_{Aeq,T}$<br>plus<br>55 dB $L_{AFmax}$ |
| | Audio visual video conference rooms Assembly halls, multi purpose halls<br>Individual study, withdrawal, remedial work, teacher preparation, interview/counselling General teaching areas, classrooms and class bases, small lecture theatres < 50 people, seminar and tutorial rooms, language laboratories, small lecture rooms Libraries<br>Nursery quiet room Nursery play room | 35 dB $L_{Aeq,T}$<br>plus<br>55 dB $L_{AFmax}$ |
| | Science laboratories,<br>metalwork/woodwork classrooms,<br>resource/light craft and practical<br>Offices, staff rooms, open plan<br>classrooms / resource areas<br>Indoor sports / indoor swimming pools | 40 dB $L_{Aeq,T}$<br>45 dB $L_{Aeq,T}$<br>45 dB $L_{Aeq,T}$ |
| | Toilets, coats and changing areas,<br>corridors and stairwells<br>Dining rooms | 45 dB $L_{Aeq,T}$<br>45 dB $L_{Aeq,T}$ |

*Source: Building Bulletin 93: 'Acoustic Design of Schools'*

## Annex 4 – Internal Noise Levels for New Hospital Build

| Room Type | Example | Criteria for noise intrusion to be met inside the spaces from external sources |
|---|---|---|
| **Ward – Single Person** | Single bed ward, single bed recovery areas and no-call suite, relatives overnight stay | 40dB $L_{Aeq}$ (day)<br>35dB $L_{Aeq}$ (night)<br>50dB $L_{AFmax}$ (night) |
| Ward – multi bed | Multi-bed wards, recovery areas | 45dB $L_{Aeq}$ (day)<br>35dB $L_{Aeq}$ (night)<br>50dB $L_{AFmax}$ (night) |
| Small office type spaces | Private offices, small treatment rooms, interview rooms, consulting rooms | 40dB $L_{Aeq,T}$ |
| Open medical areas | A&E | 45dB $L_{Aeq,T}$ |
| Circulation spaces | Corridors, hospital street, atria | 55dB $L_{Aeq,T}$ |
| Public areas | Dining<br>Waiting areas | 50dB $L_{Aeq,T}$<br>45dB $L_{Aeq,T}$ |
| Personal hygiene (en-suite) | Toilets, showers | 45dB $L_{Aeq,T}$ |

| | | |
|---|---|---|
| Personal hygiene (public) | Toilets, showers | 55dB $L_{Aeq,T}$ |
| Small food preparation areas | Ward kitchens | 50dB $L_{Aeq,T}$ |
| Large food preparation areas | Main kitchens | 55dB $L_{Aeq,T}$ |
| Large meeting rooms (>8m) | Lecture theatres, meeting rooms, board rooms | 35dB $L_{Aeq,T}$ |
| Small meeting rooms (<8m) | Meeting rooms, seminar rooms, classrooms | 40dB $L_{Aeq,T}$ |
| Operating theatres | Operating theatres | 40dB $L_{Aeq,T}$<br>50dB $L_{AFmax}$ |

Source: *Department of Health 'Health Technical Memorandum 08-01 Acoustics'*

## Annex 5 – Methodology for the assessment of transportation noise sources

**Road traffic**

In order to determine the impact of road traffic on a particular development it will be necessary for an acoustic assessment to be undertaken to determine the $L_{Aeq,T}$. It is recommended by WRS that a full 24-hour assessment be undertaken for all applications.

In some cases it will be sufficient to simply determine $L_{Aeq,T}$ during a continuous 3-hour period during the daytime. Where it is proposed to undertake this shortened methodology it is advised that this should be first discussed with WRS.

The revised version of DMRB (August 2008) Annex 5 suggests that night time measurements should be considered if night time levels are expected to be within 10 dB of daytime levels. Where the proposed development is adjacent to, or in close proximity to, major roads such as motorways or trunk roads then a night-time assessment will be required.

**Railway**

Noise from rail traffic may affect properties bounding railway lines. To determine the impact of the rail traffic on a particular development then it is necessary for an acoustic assessment to be undertaken to determine the $L_{Aeq,T}$ and $L_{ASmax}$. As many of the railway lines in Birmingham carry freight during the night it is necessary for a full 24-hour assessment to be undertaken. The assessment should provide both $L_{Aeq,T}$ and details of $L_{Asmax}$ with the frequency of occurrence.

# 6. Light Control Technical Guidance

## 6.1 Introduction

The National Planning Policy Framework 2018 (NPPF) sets out the Government's policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities. Guidance concerning noise is provided in Paragraph 180 of the NPPF.

**Paragraph 180 of the NPPF**

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

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

NPPF specifies no further details on light impact however it is noted that Paragraph 180 is wide ranging and addresses matters which focus on dark landscapes and nature conservation. WRS focus is on the control of the impact of light on residential amenity only.

Not withstanding the negative elements of unwanted lighting artificial sources provides valuable benefits to society through providing security and safety measures on car parks and extending the opportunities for sport and recreation activities through the winter months. Equally, artificial light is not always necessary and not all modern lighting is suitable in all locations. For maximum benefit, the best use of artificial light is about getting the right light, in the right place and providing light at the right time.

Certain premises such as prisons and defense premises are exempt from statutory light nuisance provisions which makes good design and planning a necessity as there is no other recourse.

## 6.2 Application of Technical Standards and Relevant Guidance

| Reference Document | Summary |
|---|---|
| Institute of lighting Engineers : *Guidance Notes for the Reduction of Obtrusive Light GN01:2011* | Recommended methodology for the assessment of intrusive light and stipulation of recommended lighting exposure levels |
| CIBSE LG04 Lighting Guide 04: Sports Lighting - LG4 | Following an introductory section describing the general requirements for sports lighting, including illuminance, light distribution, glare, emergency lighting, planning requirements and safety |
| | |

## 6.3 Reporting Requirements

Lighting assessments should be undertaken by a competent persons. Reports should contain sufficient detail to assess light impact on the vertical and horizontal planes and diagrammatic representations such as contour maps should be clear and legible. It is recommended that computer models should be used to assess lighting proposals and 3D diagrammatic representation where possible.

## 6.4 LED Lighting

The introduction of LED lighting is considered a vast improvement over older technology from a energy efficiency perspective. However the characteristics of LED lighting are different to older lamp technology and can present many problems without careful consideration been given to the correct design of lamp, required levels of illumination, colour and directivity of LED lighting which has potential to create un-natural luminance (daylight effect) and give rise to glare and spill problems.

Installations should be in keeping with the surrounding environment and designed for the intended purpose and not for commercial attraction (unless advertising signage). The use of high gantries with powerful lamps is discouraged (unless lighting is associated with sports facilities or other exempt installations)

## 6.5 Post Completion Requirements

The majority of lighting schemes are well engineered and agreed during the consultation stages of planning. However due to the difficulties of anticipating the real world impact of lighting schemes and improper installation from time to time WRS may recommend that the planning department subject the application to post completion testing of the lighting scheme for the purpose of ensuring compliance with planning conditions.

# 7. Odour Control Technical Guidance

## 7.1 Introduction

The National Planning Policy Framework 2018 (NPPF) sets out the Governments planning policies and how these are expected to be applied. It promotes sustainable development and opportunities for local communities to engage in plan making at a neighbourhood level. The core underpinning principle of the framework is the presumption in favour of sustainable development. Paragraph 7 of the NPPF states: 'The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs' One of the core planning principles in the NPPF is that planning policies and decisions should 'contribute to and enhance the natural and local environment.'

**National Planning Policy Framework 2018 and Odour**

- Paragraph 170 of the National Planning Policy Framework states *'The planning system should contribute to and enhance the natural and local environment by:…preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water, or noise pollution..'*

- Paragraph 180 of the National Planning Policy Framework advises planning policies and decisions should ensure that *'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.'*

## 7.2 Odour and Planning

An odour assessment will be required for any development with a potential for emitting odour, or that will add receptors to an area that may be subject to odour.

Unlike Local Air Quality Management, there are no prescribed limits for odour. The subjectivity of the human response to odour means that it is often not easy to set objective odour exposure standards.

However, these difficulties must not preclude the use of objective measurements, in assessing potential nuisance and in identifying control measures, where these can be justified and are considered to be appropriate.

In all cases where the generation of odours from the development can be readily anticipated, WRS will expect to be provided with objective evidence that demonstrates that odour emissions will be adequately controlled to prevent any significant loss of amenity to neighbouring sensitive land uses. This is important not least because possible odour mitigation measures could in themselves have land use and amenity implications.

Careful consideration should be given to the location of new odour sensitive developments such as residential developments, schools and hospitals near to existing odour sources. Encroachment of odour sensitive development around such odour sources may lead to problems with the site becoming the subject of complaint, essentially creating a problem where there was not one before.

Ideally a robust screening process at the application submission stage should help to identify new developments where adverse odour impacts may arise. Screening should aim to identify applications where odours are a potential issue, whether the application site is the source, or the application site is close to potential odour sources. If such new developments are identified early on, this allows early consultation with WRS.

## 7.3 Odour Impact Assessments

At the pre-application stage, sources of odour from or near to proposed developments need to be identified and assessed for potential impact. Odour Impact Assessment (OIA) is a useful tool in support of applications where the potential for odour problems has been clearly identified and where such studies are considered to be necessary and proportionate to the extent of odour problems. A properly structured OIA should seek to identify:

- All potential sources of odour and their estimated rates of emission from the new development;
- The potential for fugitive emissions of odour together with the means to control these emissions;
- The location of sensitive receptors;
- A wind rose for the site in question;
- Potential pathways to sensitive receptors;
- A description of the potential impacts including evidence provided by dispersion models taking cognisance of topographical features;
- Details of any necessary odour abatement systems or other mitigation measures with justifications for the measures being proposed; and
- Details of an Odour Management Plan (OMP) with contingency arrangements for responding to any unforeseen or unusual odour emission episodes.

## 7.4 Odour Modelling

Planning applications for developments which have the potential to cause off-site odour impact should be supported by an evaluation of the expected odour impact and proposals for mitigation measures, where necessary. The degree of detail provided in such assessments should be proportionate to the risk of odour impact, taking account of factors including the proximity of receptors, the scale of the proposed activity and the nature of the proposed development.

At one extreme, for small scale developments such as a new hot food takeaway, a relatively simple risk assessment based approach is likely to be appropriate, providing it is carried out in a thorough manner. An example of an Odour Risk Assessment Protocol for commercial kitchens is provided in the EMAQ+ / DEFRA Guidance on the 'Control of Odour and Noise from Commercial Kitchen Exhaust Systems 2018' and WRS would expect that planning applications for these types of development would be submitted with the information required in this EMAQ+ / DEFRA Guidance.

In higher risk examples, such as a new sewage treatment works, new agricultural developments such as livestock and poultry sheds a more rigorous approach to evaluating odour impact may be appropriate. Odour Impact Assessments are typically based on computer models which predict odour dispersion from the proposed development based on local weather records and estimated or predicted odour emissions from the proposed development. The outputs from dispersion modelling are usually presented as odour contours or "isopleths" on a base map of the area, and this allows potential odour impact to be predicted at odour sensitive receptor locations, such as residential developments, in the area and for this impact to be compared with 98th percentile impact benchmarks. Dispersion models can also be used to determine the level of odour mitigation required to control odour impact, or to determine the maximum permissible odour emissions from a site to avoid off-site impact or loss of amenity. These predictions, and the mitigation measures which can be prescribed as a result of objective measurement, can play a key role in preventing long term impact of odours downwind of the site.

Larger scale industrial developments with odour potential are likely to fall under the Pollution Prevention and Control Regime. Odour assessment should be considered jointly for any permit and planning application.

Any odour assessment for higher risk sites should relate to the most appropriate and current guidance for example to the Environment Agency H4 Odour Management Guidance and the Odour Guidance for Local Authorities published by DEFRA. An example of the tools available to estimate odour impact is given below:

### 7.4.1 Main Tools Available to Estimate the Significance Odour Impact

| Tool | Comments |
|---|---|
| Source emission characterisation combined with computer dispersion modelling | Usually used as a predictive tool to assess the impact of proposed plant but also successfully used to identify causes of off-site odour impact, establish long-term odour exposure levels and to rank relative efficacies of odour abatement strategies. |

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| | Requires the input of source emission data (in odour units) that may require specialist input. Allows comparison with numerical odour standards. |
| Field odour assessment using "sniff test" | For existing site that may impact upon the development. Usually suitable for sites with less odour impact. Surveys must be designed in agreement with the local authority. 'FIDOL' factors from the Defra guidance or similar should be used to assess significance. |

**7.5 Odour Control Mitigation**

The option of preventing and controlling odours relies on an ability to intervene effectively at one or more stages of the 'Source–Pathway–Receptor' process, as follows:

- Preventing the release of odorous air to the atmosphere by containment and odour control
- Preventing the formation of odorants in solid and liquid material within a process;
- Preventing the transfer of odorants from a mixture to gas phase [air];
- Preventing the transportation of odorants from the source reaching receptors;
- Influencing the quality of the odour to reduce the perception of odours as a nuisance by receptors; and
- Ensuring effective communication

### 7.5.1 Examples of Odour Control Measures

| Odour Source | Proactive / Planned Measures |
|---|---|
| Sewage treatment | Closed-containment process over high emission areas;<br><br>Odour control systems / filters |
| Hot food takeaways, food processing and commercial kitchens | Ventilation design;<br><br>Extraction & filtration system;<br><br>Vents located away from residents |

| | |
|---|---|
| Paints & solvents | Ventilation design;<br><br>Solvent extraction & recovery system;<br><br>Vents located away from residents |
| Animals, livestock & poultry | Site assessment and building design for odour control;<br><br>Stocking density planned and agreed |
| Industrial / chemical processes | Ventilation design;<br><br>Extraction & filtration system;<br><br>Vents located away from residents |
| Storage & spills | Design of containment and covered areas for moving liquid |

## 7.6 Hot Food Takeaways, Food Processing and Commercial Kitchens

By far the most common planning applications that WRS receive that have a potential to cause problems with odour are for hot food takeaways. For this reason this section of the TGO will present in more detail the expectation of WRS for information to be submitted as part of the planning application for such developments.

The impact of hot food takeaways on residential amenity is an important consideration when determining planning applications. Hot food takeaways will produce odours primarily as a result of the cooking process and this can cause amenity problems particularly in areas which are residential in character. Natural ventilation is generally not adequate to dissipate such odours and an effective system incorporating an extract duct, fan and filters are often required for the extraction and dispersal of cooking. It should also be noted that a ventilation system can itself cause noise problems unless competently designed, but this will not be dealt with in detail in this section, and reference should be made to Section 5 of this document for noise.

In terms of odours, these may be generated by the hot food use, through the preparation, cooking and extraction of cooking odours. In order to mitigate against this, high quality odour abatement systems are required to treat and disperse at high level, any residual cooking odours. Proposals for hot food takeaways should include detailed information as to how odours will be removed including the abatement technologies proposed to manage this issue.

## 7.7 Information Which May Be Required For Hot Food Takeaway Applications

The following based on the recommendations in the EMAQ+ / DEFRA Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems 2018 is the information that WRS would expect to be supplied with a planning application:

### 7.7.1 Required Information On Premises and Specification of Components of Proposed Ventilation System

| Information to be Supplied | Details |
|---|---|
| **Premises** | • the types of meal served, e.g. fish & chips, Chinese food, Indian food, etc<br>• the method(s) of preparation and cooking<br>• proposed hours of operation of the business and details of any existing or new ventilation plant |
| **Plans and Drawings** | • Provide a scaled plan showing the internal arrangement of the premises and the dimensions/location of the ventilation system. The plan must contain external elevations of the buildings<br>• showing the route and size of the system<br>• The location of all filters and odour abatement equipment, including the fan must be clearly marked. Where the location of a filter is shown the type must be clearly identified. |
| **Filters** | • The minimum specification should include the following;<br>  ○ Grease Baffle filters (Primary & Secondary)<br>  ○ Particle filters<br>• Information to include;<br>  ○ dimensions of the filter(s)<br>  ○ nature of the filter media<br>  ○ the total number of filter panels in the filter bed<br>  ○ manufacturer's recommendations on the frequency and type of maintenance of the filter having regard to the conditions that it will be used under. |
| **Odour counteractant or neutralising system (where proposed)**<br>**Note: WRS do not consider odour neutralising systems, where a 'scented' substance is introduced into the extract air stream, as a primary odour abatement system.** | • The proposed Primary Odour Abatement Plant, plus any Secondary Odour Abatement Plant if necessary, for the effective control of odour should be clearly detailed within the application.<br>• A copy of the manufacturer's product data sheet for each element should be supplied that clearly shows:<br>  ○ the odour neutralising technology (including chemical treatment for odour counteractants if included) to be used |

| | |
|---|---|
| | ○ COSHH data sheets for chemical counteractants to be used<br>○ the anticipated rate of use per day/week<br>○ details of cleaning procedures including recommended cleaning frequency<br>○ identification from the installer/manufacturer that the proposed system will be capable of adequately abating the odours from the proposed hot food use. |
| **Cooker hood** | • The following information on the characteristics of the cooker hood should be supplied that clearly shows the:<br>○ length that the cooker hood overhangs the appliances<br>○ velocity at the cooker hood, expressed in metres per second (m/s);<br>○ dimensions of the opening of the cooker hood. |

## 7.8 Required Information On Proposed Ventilation System Operation

| Information to be Supplied | Details |
|---|---|
| **System Operation** | • The extract flow rate (expressed as m/s) at the proposed rate of extract<br>• The dwell time of the gases through any carbon filter or the contact time for any UV / Ozone abatement system.<br>• Volume of the kitchen<br><br>(Note: The system performance is dependent upon the extract rate of the air. Where the rate can be adjusted by the use of dampers or a variable speed fan, then the conditions under which the extract rate can be achieved must be described.) |
| **Air Supply** | • The system should enable the shopfront and cooking area to be operated under negative pressure, to ensure the odours are vented through the system and not through doors or windows or the structural elements of the building.<br>• Sufficient ventilation shall be provided for incoming air to replace displaced air through the system. |
| **Height and Velocity of the Final Discharge** | • The height and velocity of the final discharge are the two important factors. Generally, the greater the flue height, the better the dispersion and dilution of odours. |

| | |
|---|---|
| | • The final discharge of air should terminate at least 1m above the eaves of your building. However, if surrounding buildings are higher or very close they will affect odour dispersion and dilution. Additional techniques will be required, such as an increase in flue height, efflux velocity and/or additional filters.<br>• Each situation will be unique therefore each should be considered individually.<br>• The final discharge should be vertically upwards at a rate of at least 5 m/s. The number of bends in the ducting should be minimised and the ducting should have a smooth internal surface with sufficient access points for ease of cleaning. Obstructive cowl caps shall not be permitted on any flue. |
| **Noise** | • Data on the noise produced by the system as a whole should be provided including:<br>o sound power levels or sound pressure levels at given distances, preferably the nearest recipient (the assumptions to this calculation must be clearly stated);<br>o an octave band analysis of the noise produced by the system should also be provided, where possible; and<br>o hours of operation of the ventilation system (where this differs from the hours of opening). |
| **Maintenance** | • A schedule of maintenance must be provided including details for:<br>o cleaning of washable grease filters<br>o frequency of inspection and replacement of all filters (grease filters, pre-filters and carbon filters where proposed);<br>o inspection and servicing of fans<br>o if schedule is not based on manufacturer's instructions include the reasons why. |
| **Additional Notes For Guidance** | • The air inlets must not permit pests to enter the kitchen. Fly screens are an example of how this can be achieved.<br>• Sufficient air must be permitted into the premises to replace air extracted. The method for supplying this make-up air should be detailed. The route of the air into the kitchen must not result in its contamination, for example passage through a toilet. Separate provision must be made for ventilation of a toilet.<br>• If a any cooking appliance is fuelled by gas then separate ventilation must be installed in accordance with the relevant gas and health & safety regulations. |

Not withstanding the above considerations for odour control applicants are strongly advised to liaise with the WRS Food Safety Team regarding kitchen design. All installations must comply with current Food Safety/Health & Safety regulations.

Any application submitted with either a lack of detail or where some elements of the above are missing may well be recommended for refusal on the grounds of insufficient information to determine the application. This is especially important where sensitive end uses (e.g. residential) are immediately adjacent to the proposed application site as adverse impacts on residential amenity must be considered in full when determining the suitability of a hot food takeaway application.

## 7.9 Application of Technical Standards and Relevant Guidance

| Reference Document | Summary |
|---|---|
| DEFRA Odour Guidance for Local Authorities 2010 | The primary aim of this Guide is to provide a toolkit for local authorities to assist them in providing a consistent, effective and fair approach to their regulatory duties with regard to odours. |
| EMAQ+ / DEFRA Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems 2018 | Provides information on best practice techniques for the minimisation of odour and noise from commercial kitchen exhaust systems. |
| Environment Agency Guidance H4 Odour Management 2011 | This guidance provides benchmarks against which predicted odour concentrations can be assessed. It also provides guidance for use in modelling emissions of odour and in undertaking qualitative 'sniff test' assessments. |
| Institute of Air Quality Management (IAQM) Guidance On The Assessment of Odour For Planning V1.1 2018 | This Guidance is for assessing odour impacts for planning purposes. |
| Environment Agency Guidance for developments requiring planning permission and environmental permits 2012 | Guidance where developments need both planning permission and an environmental permit |
| Environment Agency Odour Management at Intensive Livestock Installations 2005 (IPPC SRG 6.02 (Farming)) | Guidance used in determining conditions for odour at pig and poultry installations |

# 8. Construction & Demolition Guidance

## 8.1 Liaison

**Pre Construction**

Prior to work commencing, the Contractor must meet with Worcestershire Regulatory Services (WRS), in order to discuss their methods of working and measures planned to minimise disruption throughout the construction works. In addition to this further meetings may be held to discuss environmentally sensitive works which may occur due to the demand for night time working or use of certain type of construction techniques.

The Contractor should appoint a responsible person to liaise with WRS, local residents, businesses and other authorities in order to keep them informed of matters likely to affect them. Good relations can be developed by keeping neighbours informed of progress and by responding to complaints quickly and fairly.

Prior to site work commencing, neighbours must be informed of:

- the start date;
- the duration and nature of the project;
- the principal stages of the project;
- details of contact names and numbers of appropriate site personnel.

The names and contact details of appropriate site personnel should be forwarded to WRS using the Site Information Sheet (Doc1) at the earliest opportunity.

A list of useful contact names and telephone numbers is included at the rear of this document.

**During Construction/Demolition Works**

There shall be at least fortnightly communication with site neighbours, for example by newsletter, in order to keep them informed about current progress and forthcoming works. The newsletter should also contain the information suggested in section 5.4 above, together with details of the Pollution Team contact. Feedback should be requested from affected neighbours throughout the project and at the end, in order to allow modification of activities to reduce future project impacts. A display board

should be erected outside the site, which as a minimum shall identify key personnel, contact addresses and telephone numbers. Additional information could include details of the scheme and its progress.

WRS must be told in advance when any unusual activities including out-of-hours working are planned. The Site Hours Variation Request Sheet (please visit WRS website for further details) must be completed and returned to WRS at least 5 days before the activity is to take place. The Community Protection Team in WRS must be supplied with a current 24-hour call out number that will be answered in the case of a complaint or an emergency.

## 8.2 Documentation

The Contractor should keep all appropriate documentation relevant to the requirements of this Code in designated files held on site. They must be available at all times for inspection and review by WRS or other authorities and should include as a minimum a site information sheet, noise, vibration and dust monitoring results, waste management documentation, a complaints/incidents log with actions taken, liaison minutes, letters, photos and newsletters.

**Working Hours**

As a general rule of thumb if no-one is disturbed by works then there is no absolute bar to 24-hour working. However, such circumstances are rare and usually apply to second fix work. Activities that are likely to affect residents will be subjected to working hours restrictions.

Permitted hours for site work will normally be the following :

- 08:00 - 18:00 hours (Monday to Friday);
- 08:00 - 13:00 hours (Saturday) (certain noise sensitive residential areas identified
- no working is permitted on Sundays or Bank Holidays.

The work hours may be varied according to local circumstances, for example where a site is in close proximity to restaurants, places of worship or residential properties.

Any works outside the permitted hours can only be undertaken with the approval of WRS using the Site Hours Variation Request Sheet (Please see WRS website for further details), and will only be granted in exceptional circumstances. Approval will be conditional on the Contractor informing local residents in advance of the proposed work.

**Air Quality & Dust**

A dust and air quality management plan must be produced (potentially as part of the Environmental Management Plan) and submitted to WRS. This plan must contain a detailed methodology laying out details of, and controls over, all relevant activities. The plan must consider the entire lifetime of the project and sequence of works, and consider many details such as the water supply for the site, plans to deal with debris, specific areas to be encapsulated, scaffolding, and waste management. Burning of materials on site is not permitted under any circumstances.

**Noise and Vibration**

This Code of Practice is a notice of the WRS general requirements under Section 60 of the Control of Pollution Act 1974. The Contractor may also be informed of additional requirements during consultations with WRS. In addition to working hours and community liaison, all works must be carried out in accordance with BS 5228-1&2:2009+A1:2014.

All works must employ Best Practicable Means as defined by Section 72 of the Control of Pollution Act 1972 to minimise the effects of noise and vibration. WRS must be satisfied that all means of managing and reducing noise and vibration, which can be practicably applied at reasonable cost, have been implemented.

A written evaluation of methodologies used must be made available to WRS and include justifications with regards to the minimisation of noise and vibration. WRS considers the off-site preparation of as many materials as possible an essential requirement for Best Practicable Means, in particular for the cutting of decking and steelwork. Where appropriate, the following measures to minimise noise and vibration levels should be adopted ; employing only modern, quiet and well-maintained equipment (all equipment must comply with the EC Directives and UK Regulations set out in BS 5228-1&2:2009+A1:2014).

- Using low impact techniques, such as demolition munchers and bored or hydraulically-jacked piling rigs;
- careful planning of the sequence of work in order to minimise the transfer of noise/vibration to neighbours;
- using fully silenced modern piling rigs with engines to Euro Standard IV and careful operation of the rig so there is no reversing of the Kelly/auger bars;
- using electrically powered equipment run from the mains supply, or when this is not available, generators compliant with Euro Standard IV;
- use of screws and drills rather than nails for fixing hoardings etc; careful handling of materials & waste such as lowering rather than dropping items;
- erection of acoustic screens where necessary; avoidance of unnecessary noise (such as engines idling between operations, shouting, loud radios or excessive revving of engines) by effective site management.

The distance between noise/vibration sources and sensitive neighbours should be maximised and the transmission path obstructed, with options considered in the order of source-pathway-receptor. Where practical this can be achieved by:

- Siting of stationary plant and loading/unloading areas;
- erecting impervious hoardings, of at least 5 kg/m2 surface density, where possible higher than the line of sight to neighbours;
- leaving building façades and boundary walls intact as long as possible during demolition and boarding/bricking up windows;
- the use of existing non-sensitive structures as shields; and, the use of temporary structures; cutting of transmission pathways for vibration.
- In addition to the above, a neighbour liaison scheme must be implemented as an essential element of the Best Practicable Means to minimise the effects of noise and vibration, as outlined in Section 1 (Pre construction).

## 8.3 Monitoring Regimes

**General**

WRS encourages contractors to undertake regular intelligence-lead monitoring of noise and vibration levels by looking at the work programme and identifying aspects likely to cause significant noise/vibration. Receptor points are to be agreed with Worcestershire Regulatory Services prior to initiation of monitoring. Results should be compared against suitable baseline data as a useful means of:

- Controlling noise and vibration, and identifying problems at an early stage (it is particularly valuable to carry out monitoring during the early stages of a project);
- providing an objective basis for evaluating complaints;
- safeguarding Contractors against claims of damage.

Prior to commencing work, it is essential to undertake monitoring of ambient noise levels around the site at sensitive receptors. This will provide baseline data for comparison with levels present during the works. A baseline vibration exercise will be unnecessary unless neighbours are clearly affected by any existing source of substantial vibration e.g. rail track.

**Noise Limits**

The suitability of specific noise limits is highly dependent upon the individual situation. The factors to be considered include:

- The characteristics of the noise and its potential effect on the neighbours;
- baseline ambient noise levels; and,
- the nature and duration of the works.

In addition, following complaints specific noise levels may be set to prevent speech interference in offices and loss of trade. Levels of 75 dB a working day over a 10-hour period are suggested as a general rule. WRS expects noise control to meet or reduce the average noise from the site to this level. In built up environment this is not always attainable, in which case best practicable means must be applied to reduce noise and vibration as far as possible. As a guide, typical daytime levels for noisy temporary works at neighbouring premises usually lie in the range of 70 – 80 dB LAeq.

Noise levels within neighbouring offices or residences during noisy periods must enable workers to carry out conversations, both face-to-face and on the telephone, and allow normal business to be conducted. It is considered that a noise level of 65 dBA is likely to cause annoyance and interference (dependent on the type of noise). Such noise should be restricted to hours outside the normal working day of 09.00 – 17.00 hours.

In residential areas, timings of works with noise levels exceeding 65dBA should be discussed and agreed with Environmental Health Officers prior to commencing.

Noise measurements should ideally be taken with a Class 1 Integrating Logging Sound Level Meter calibrated (before and after) with a Class 1 Acoustic Calibrator. LAeq, LCpeak and LAFmax, F noise levels should be recorded together with a record of all events potentially affecting the noise level at the time of monitoring.

**Vibration Limits**

When carrying out works which may produce vibration, all potential receptors should be considered, with particular attention to be paid to the following:

- Occupiers and users of buildings;
- Hospitals or laboratories;
- IT related issues; and,
- Cosmetic or structural damage to buildings or heritage sites.

People's response to perceptible vibration is accentuated by their fear of building damage. Suitable guidance upon the levels of vibration, which may cause building damage, can be found in BS 7385-2:1993. Guidance relating to the potential effect upon the operation of computers and other relatively sensitive equipment can be found in Section 8.6 of BS 5228-2:2009+A1:2014.

Complaints of vibration are usually concerned with fear of the unknown and the potential affects of relatively low levels of vibration in buildings. This problem is best addressed by:

- Liaison with all parties potentially affected, with explanations given of precisely when they are likely to be affected by specific activities;
- monitoring affected parties to re-assure occupants as to the relative levels of vibration compared with building effect (BS 7385-2:1993).

Vibration meters should preferably record 3 orthogonal Peak Particle Velocity values (15 minutes of 10 second or shorter samples). Where complaints are received, the contractor/client should consider the need for monitoring at neighbouring premises.

**Complaints & Section 60 and 61 Notices under COPA 1974**

The Control of Pollution Act 1974 Part III restricts and limits noise and vibration from a construction site. If complaints are received by WRS Community Protection , where it is considered necessary, will serve a Section 60 notice on the Contractor for the control of noise and vibration at the site. This notice can:

- specify the plant or machinery that is or is not to be used;
- specify the hours during which work can be carried out; and/or,
- specify the levels of noise and vibration that can be emitted from the site.

The Contractor can apply in advance for a consent, in the form of a Section 61 notice, regarding the methods and conditions by which they are intending to undertake the works and control nuisance.

WRS actively discourages the use of Section 61 consents but it does support a system of prior agreement on similar lines, as this allows a much more flexible approach of greater benefit to the Contractor.

Section 60 notices will be served where they are considered necessary. Contraventions of either Section 60 or 61 may well result in legal proceedings, leading to further costs and delays for the Contractor.

## 8.4 Vehicle Movements

All deliveries of materials and plant to the site and removal of waste should, where possible, be carried out within normal site working hours. Any early morning or evening deliveries must have approval from the Pollution Team. This should be requested using the copy of the Site Hours Variation Request Sheet (Appendix H).

The site layout should be designed to minimise potential effects on neighbours. A competent banksman should be employed to provide assistance to vehicles accessing and leaving the site, thereby ensuring minimal traffic disturbance and pedestrian safety.

Vehicle movements should be planned to ensure that Lorries do not arrive or depart outside standard hours. No daytime or night-time parking of lorries will be permitted outside agreed areas.

Where appropriate, deliveries should be arranged on a just-in-time basis in order to prevent vehicles queuing outside site.

The generation of dust whilst loading or unloading materials must be controlled by the use of chutes, bagging, sheeting and damping down. Where vehicles are leaving unpaved sites, adequate wheel washing arrangements should be employed to prevent contamination of the highway. Loads containing waste material leaving site should be sheeted before travelling on the highway.

## 8.5 Light Pollution

Light pollution can be a statutory nuisance and is defined as any form of artificial light which shines outside the area it is required to illuminate. Unnecessary use of lights is considered a waste of energy. Any use of lighting should have regard to these facts and should be designed to prevent any nuisance to residents or road traffic and be used primarily for reasons of health and safety or security. Site lighting will be located and aligned so as not to intrude into residential properties, on sensitive areas, or constitute a road or rail hazard.