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## APPENDICES

Appendix A Glossary of Acoustic Terminology

## 1 NOISE

### 1.1 Introduction

- 1.1.1 L A Environmental Ltd were requested by Keepmoat to review and update the noise chapter of a previously submitted Environmental Statement (ES) for Trinity South. An outline Planning Application was submitted to South Tyneside Council in March 2009 by Entec UK Ltd [Application ref: ST/0588/09/OUT].
- 1.1.2 The noise assessment was presented in Chapter 8 of the ES and the purpose of this report is to revise any relevant sections with more up to date information, including Government Guidance and noise monitoring data.

## 2 METHODOLOGY

### 2.1 Policy Background

#### National Planning Policy Framework

- 2.1.1 Since the production of the ES and submission of the outline planning application for Trinity South in March 2009 the planning system has been transformed. In March 2012, the National Planning Policy Framework (NPPF) came into force and represents the government's commitment to sustainable development, through its intention to make the planning system more streamlined, localised and less restrictive.
- 2.1.2 The NPPF provides a set of overarching aims, which broadly reflect those already contained in the Noise Policy Statement for England (NPSE) which is aimed at the avoidance of significant adverse impacts and reduction of other adverse impacts on health and quality of life.
- 2.1.3 The document replaced many planning guidance documents which previously informed the planning system in England, including PPG24, which has been withdrawn. This has created a gap between policy aims and any technical guidance available by which the realisation of those aims can be achieved.
- 2.1.4 The new framework states that:

*Planning policies and decisions should aim to:*

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *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;*

- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

2.1.5 Further NPPF aims related to noise include:

**Clause 109**

*The planning system should contribute to and enhance the natural and local environment by: preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability;*

2.1.6 NPPF affirms that National Policy Statements form part of the overall framework of national planning policy and should be a material consideration in decisions on planning applications. The Noise Policy Statement for England (NPSE) came into force in 2012 and states:

*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.*

*This Noise Policy Statement for England (NPSE) should apply to all forms of noise including environmental noise, neighbour noise and neighbourhood noise. The NPSE does not apply to noise in the workplace (occupational noise).*

**Noise Policy Vision**

**Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.**

**Noise Policy Aims**

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

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

- 2.1.7 The NPPF noise aims widely reflect those in NPSE. The NPSE does however include some context within the explanatory note to assessing noise impact and uses established concepts from toxicology currently being applied to noise impacts, these include:

**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.*

**SOAEL . Significant Observed Adverse Effect Level**

*This is the level above which significant adverse effects on health and quality of life occur.*

**LOAEL . Lowest Observed Adverse Effect Level**

*This is the level above which adverse effects on health and quality of life can be detected.*

- 2.1.8 It is not possible to have a single objective noise-based measure that defines SOAEL that is 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.
- 2.1.9 It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

**The first aim of the Noise Policy Statement for England**

*Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*

*The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development.*

**The second aim of the Noise Policy Statement for England**

*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.*

*The second aim of the NPSE refers to the situation where the 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. This does not mean that such adverse effects cannot occur.*

### **The third aim of the Noise Policy Statement for England**

*Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*

*This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development, 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.*

- 2.1.10 Unfortunately, the above guidance provides no objective, tangible standards or criteria which enable planning decisions to be made. In the absence of such guidance, quantification of noise impact in terms of guidance such as BS8233, which presents noise limits and criteria based on World Health Organisation recommendations, can therefore be considered as appropriately assessing the potential noise impact with regard to toxicology concepts and hence in line with the principles of the NPPF and NPSE.

### **British Standards and other Guidance Documents**

- 2.1.11 BS 4142:1997, BS 8233: 1999, CRTN, DMRB, WHO Guidelines and BS5228 are still relevant in the assessment of industrial noise, control of noise in buildings, road traffic noise, outdoor living area and assessment of construction noise respectively. Therefore the advice presented in the ES remains unchanged in relation to these standards and guidance documents.

## **2.2 Relevant Terminology**

- 2.2.1 The terminology remains unchanged from the information presented in Chapter 8 of the ES.

## **2.3 Methodology**

### **NPPF & NPSE**

- 2.3.1 If a development meets the recommendations of BS8233 and any associated local authority noise requirements, it can be considered as being below the level where there is no detectable adverse effect on health and quality of life due to noise, and this meets the NOEL (No Observed Effect Level) set out in the NPSE.

**BS5228**

- 2.3.2 In order to protect potential future residents against the impact of noise, the guidance given in British Standard 8233: 1999, ‘Code of practice for Sound insulation and noise reduction for buildings’ (BS8233) should be considered. BS8233 provides information on the design of internal acoustics in buildings. It deals with control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations
- 2.3.3 Table 1 below sets out the range of levels recommended in BS8233 for residential accommodation.

Table 1:  
Indoor ambient noise levels in spaces when they are unoccupied

Criterion	Typical situations	Design range $L_{Aeq,T}$ dB	
		Good	Reasonable
Reasonable resting/sleeping conditions	Living rooms Bedrooms <sup>a</sup>	30	40
		30	35

<sup>a</sup>For a reasonable standard in bedrooms at night, individual noise events (measured with F time-weighting) should not normally exceed 45dB  $L_{Amax}$ .

- 2.3.4 BS8233 also provides guidance for acceptable levels of noise for outside areas, such as gardens and balconies. Barriers or bunds should be considered to protect these areas and it is desirable that the steady noise level does not exceed 50dB  $L_{Aeq,T}$  with an upper limit of 55dB  $L_{Aeq,T}$ .

**WHO Guidelines for Community Noise**

- 2.3.5 In 1999 the World Health Organisation proposed Guidelines for Community Noise. The scope of the WHO’s effort to derive guidelines for community noise was to consolidate actual scientific knowledge on the health impacts of community noise and to provide guidance to environmental health authorities and professionals trying to protect people from the harmful effects of noise in non-industrial environments.
- 2.3.6 The guidelines suggest that during the daytime, few people are highly annoyed at  $L_{Aeq}$  levels below 55 dB(A), and few are moderately annoyed at  $L_{Aeq}$  levels below 50 dB(A). Sound levels during the evening and night should be 5–10 dB lower than during the day. For intermittent noise, it is emphasized that it is necessary to take into account both the maximum sound pressure level and the number of noise events.
- 2.3.7 Table 2 presents the various guideline values for community noise in various situations.

Table 2:  
Guideline values for community noise in specific environments

Specific environment	Critical health effect(s)	dB L <sub>Aeq</sub>	Time period (hours)	L <sub>Amax</sub>
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, night-time	45	8	60

2.3.8 Indoor guideline values for bedrooms are 30dB<sub>L<sub>Aeq</sub></sub> for continuous noise and 45dB<sub>L<sub>Amax</sub></sub> for single sound events. Lower noise levels may be disturbing depending on the nature of the noise source. At night-time, outside sound levels about 1 metre from facades of living spaces should not exceed 45dB<sub>L<sub>Aeq</sub></sub>, so that people may sleep with bedroom windows open. This value was obtained by assuming that the noise reduction from outside to inside with the window open is 15 dB. To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35dB<sub>L<sub>Aeq</sub></sub>.

## 2.4 Significance Evaluation Criteria

### Determination of Significant Noise Effects

- 2.4.1 The determination of significance is largely based on the relevant assessment criteria for the specific noise issue being assessed. As PPG24 has been withdrawn NEC's are no longer applicable in determining a sites' suitability for residential development.
- 2.4.2 With regard to NPPF the relationship between sustainability and compliance with acoustic design criteria may be flexible and require a form of cost-benefit analysis, or other assessment, in order to demonstrate that development is acceptable. However, in the first instance, the following noise criteria outcomes may typically apply:



Table 3: Development Noise Impact and Acoustic Acceptability Outcome Matrix		
Noise Impact	Noise Impact Category	Acoustic Acceptability Outcome
<ul style="list-style-type: none"> <li>Development does not give rise to significant adverse impact on health and quality of life.</li> <li>Other adverse impacts can be minimised / mitigated through standard design.</li> </ul>	A	Development is suitable/acceptable without further acoustic design requirements
<ul style="list-style-type: none"> <li>Development may give rise to significant adverse impact/ other adverse impact on health and quality of life.</li> <li>Significant adverse impacts and other adverse impacts cannot be minimised without acoustic intervention in terms of design /noise control.</li> </ul>	B	Development is in principal suitable/ acceptable subject to acoustic design requirements
<ul style="list-style-type: none"> <li>Even with proposed mitigation Development gives rise to significant adverse impact on health and quality of life.</li> </ul>	C	Development is unsuitable /unacceptable

Source: <http://noisenuisance.org/2012/07/25/national-planning-policy-framework-noise-policy-statement-for-england/>

### 3 BASELINE

3.1.1 Noise monitoring was carried out by Entec for the outline application between 22-24 January 2008. Five noise monitoring locations were selected throughout the whole South Shields Framework. The locations are depicted in Figure 1 in Appendix A and are listed in Table 4 below in conjunction with the results of the survey, which have been rounded to the nearest whole number.

Table 4: Noise survey results dB(A) January 2008					
Location	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>AF90</sub>	L <sub>AFmax</sub>	Comment
1 Reed Street	61	94*(64)	56	80	Distant and local traffic noise, birdsong
2 Laygate Roundabout	61	61	56	98	Traffic noise from roundabout, working noise from garage
3 Portberry Way	56	57	53	81	Industrial noise, road traffic, birdsong, people on street
4 Trinity Walk	55	56	53	78	Distant road traffic, aircraft, industrial noise
5 Laygate Street	55	56	52	77	Industrial noise and distant road traffic noise

\* 94dB<sub>L<sub>A10</sub></sub> has assumed to be a typographical error and has assumed to be 64dB<sub>L<sub>A10</sub></sub>.

3.1.2 It is unclear from Figure 1 the exact position of the monitoring locations. However, in December 2012 further noise monitoring was carried by L A Environmental Ltd out at the approximate locations to the above to verify the levels recorded. The results of the survey carried out on Tuesday 11<sup>th</sup> December 2012 are shown in Table 5 below and overleaf which also show the noise profile at each location over a 10-minute sample period.

Table 5: Noise survey results dB(A) December 2012					
Location	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>AF90</sub>	L <sub>AFmax</sub>	Comment
1 Reed Street	62	66	52.7	76	
2 Laygate Roundabout	63	66	58	76	
3 Portberry Way	54	56	50	75	
4 Trinity Walk	57	61	46	71	
5 Laygate Street	52	54	50	65	

3.1.3 The L<sub>Aeq</sub> results are within +/- 1-2dB(A) of the original levels which were recorded over much longer time periods. Combined with the possible discrepancy of the monitoring positions being different it is considered that the levels are within acceptable tolerance and the levels recorded in 2008 for the previous application can be used.

## **4 MITIGATION INCORPORATED INTO THE PROPOSED DEVELOPMENT**

4.1.1 The information relating to mitigation remains unchanged from the original submission.

## **5 PREDICTED IMPACTS AND RESIDUAL EFFECTS**

### **5.1 Future Site Users**

5.1.1 As PPG24 has been superseded sites proposed for future residential development are no longer assigned to Noise Exposure Categories. However, the advice given in relation to the design of the site is still relevant in terms of site layout and internal configuration of rooms.

5.1.2 It is generally beneficial to design the internal room layout or orientate the dwellings as much as possible such that only windows serving non-habitable rooms face directly towards the road traffic. Wherever practicable, the most noise sensitive rooms, i.e. bedrooms, should be positioned on facades facing away from the road. Similarly, where possible, gardens should be orientated to be on the building elevation that is shielded from the road traffic to meet the World Health Organisation Guidelines for Community Noise.

5.1.3 Wherever possible, areas of land can be used to form a 'buffer zone' to increase distance between new dwellings and the noise sources. Areas that are not noise-sensitive (such as internal distribution of roads and areas of public amenity space) can be used to create such buffer zones to increase separation between noise sources and new residential areas.

### **5.2 Operational, Construction and Traffic Noise**

5.2.1 The information contained in these sections remains unaltered and unaffected by the NPPF and remains relevant.

## **6 EVALUATION OF EFFECTS**

### **6.1 Summary of Noise Effects**

6.1.1 The Summary of Noise Effects detailed in Table 8.11 of the ES refers again to NEC's which are now not applicable. However, it is considered that some areas where housing is now proposed would be exposed to higher noise levels than those presented in this report. For example there are residential dwellings proposed to the south of St George Medical Centre adjacent to the A194. Noise levels at this location are likely to be higher than those measured at Reed Street or Laygate Roundabout which were the two nearest measurement positions.

## 6.2 Future Site Users

- 6.2.1 It was concluded that noise levels are within NEC B, which relates to noise levels up to  $63\text{dB}_{\text{Leq}}$  during the daytime period. However, as stated in 6.1.1 noise levels adjacent to the A194 are likely to be higher than this with a potential ambient level of  $70\text{dB}_{\text{Leq}}$  during the daytime.
- 6.2.2 It is still considered that appropriate guideline values can be achieved at this location, however, additional glazing specification would be required and acoustic ventilation would also need to be considered.

## 6.3 Operational, Construction and Traffic Noise

- 6.3.1 The information contained in these sections remains unaltered and unaffected by the NPPF and remains relevant.

## 7 SUMMARY

- 7.1.1 Since the submission of the Environmental Statement in March 2009 by Entec, the planning system has been overhauled and PPG24, which related to Planning and Noise, was superseded in March 2012 by the National Planning Policy Framework (NPPF). Noise Exposure Categories (NEC's) are no longer referenced, however, the other documents referred to in the Noise Section of the ES are still applicable for applications such as that proposed at Trinity South.
- 7.1.2 The suitability of the noise climate at the site for residential development has been assessed. The assessment has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the Noise Policy Statement for England (NPSE). Noise assessment and design targets for internal and external noise levels recommended in BS8233 have been used to quantify noise impact and determine suitability for residential development with due regard to effects on health and quality of life as set out in the NPSE.
- 7.1.3 Outline noise control measures have been recommended in order to meet suitable noise level criteria for the proposed residential development.
- 7.1.4 The potential noise issues identified in the Entec report could be dealt with by appropriately worded conditions attached, if planning permission is forthcoming, to the grant of approval.
- 7.1.5 It is considered that the site is suitable for residential development in planning and noise terms, as acceptable noise levels could be achieved following the design and implementation of suitably specified noise mitigation measures. On this basis the noise assessment methodology and conclusions meet the principles set out in the NPPF and NPSE.

## 8 REFERENCES

National Planning Policy Framework, Department for Communities and Local Government March 2012

Noise Policy Statement for England (NPSE), Department for Environment, Food and Rural Affairs March 2010

Acoustic Design for Development post PPG24 Author Chris Hurst BSc, MCIEH, MIOA

<http://noisenuisance.org/2012/07/25/national-planning-policy-framework-noise-policy-statement-for-england/>



Appendix A: Noise Assessment Locations

