

# Broadford Bridge-1 Noise Addendum Report

## Introduction

- 9.1 Following consultation with the Environmental Health Officer at Horsham District Council (Lee Money) it was agreed that a baseline noise survey would be undertaken at Broadford Bridge-1 to further inform the Noise Assessment.
- 9.2 This addendum report presents the results of the baseline noise survey and is supplementary to the Environmental Statement submitted with Planning Application WSCC/052/12/WC. This addendum provides further detail on the existing night-time noise levels at receptors in close vicinity to the proposed drilling, together with a revised impact assessment of the proposed operations. It should be read in conjunction with the Noise Environmental Statement (Chapter 9).

## Noise Measurement Survey

### *Method*

- 9.3 A noise survey was undertaken to provide additional information on the impact of drilling operations during the night-time period. Noise measurements were conducted at two locations representative of the closest residential locations to the proposed drilling site. The noise measurements were conducted from 3pm on Wednesday 24<sup>th</sup> October to 11am on Thursday 25<sup>th</sup> October 2012. **Figure 1**, at the end of this addendum, shows the noise monitoring locations.
- 9.4 The noise survey was conducted with regard to BS 7445<sup>1</sup>, parts 1 and 2 and the procedure described in BS 4142<sup>2</sup>. Noise measurements were conducted with fully calibrated instrumentation capable of satisfying the requirements of IEC 61672 for Type 1 instruments.
- 9.5 All noise measurements were conducted at a microphone height of around 1.5 metres above ground level and 3.5 metres away from any reflecting surface other than the ground, i.e. in free-field conditions. The calibration of the Sound Level Meters (SLMs) was checked before and after each survey period using the field calibrator, with no change in calibration level observed.
- 9.6 Noise measurements were taken at each location, comprising 5 minute continuous measurements during the night. The following parameters were recorded:

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<sup>1</sup> British Standards Institution, (2003). BS 7445-1:2003 - *Description and measurement of environmental noise. Guide to quantities and procedures*. BSI, London

<sup>2</sup> British Standards Institution, (1997). BS 4142:1997 - *Method for rating industrial noise affecting mixed residential and industrial areas*. BSI, London

- LA90 - the sound pressure level exceeded for 90% of the measurement period and is indicative of the background noise level.
- LAeq - the equivalent continuous sound pressure level over the measurement period and the generally accepted descriptor of environmental noise.
- LAm<sub>ax</sub> is the maximum sound pressure level that occurred within the measurement period.

9.7 Noise measurements are normally taken with an A-weighting (denoted by a subscript 'A') to approximate the frequency response of the human ear. The frequency response of the human ear varies with the sound pressure level.

*Results*

9.8 The results of the measurement survey are shown on Tables 1 and 2.

**Table 1 Noise level Summary – Woodbarn Farm**

<b>Position 1</b>						
<b>Time</b>	<b>LAeq (dB)</b>			<b>LA90 (dB)</b>		
<b>(hh:mm)</b>	<b>Av (1h)</b>	<b>Min (5m)</b>	<b>Max (5m)</b>	<b>Av (1h)</b>	<b>Min (5m)</b>	<b>Max (5m)</b>
15:00	52.1	48.9	54.4	44.0	42.5	45.4
16:00	50.6	46.9	55.9	43.2	41.0	45.3
17:00	50.9	47.6	53.2	45.1	43.5	46.4
18:00	59.1	51.2	64.6	49.1	44.2	54.6
19:00	47.7	43.5	52.4	39.4	35.7	43.5
20:00	44.0	41.0	48.8	35.6	32.8	39.4
21:00	43.0	38.5	48.8	34.4	32.8	37.4
22:00	41.8	34.3	48.3	33.2	29.9	36.1
23:00	40.6	35.3	47.1	30.6	27.1	37.3
00:00	37.4	29.4	42.3	28.7	26.2	30.2
01:00	38.5	30.5	44.9	28.1	26.9	29.5
02:00	30.5	27.1	34.0	25.9	24.0	27.1
03:00	30.2	27.3	34.5	25.1	24.5	26.3
04:00	34.2	24.7	42.6	24.2	22.7	26.6
05:00	37.2	31.5	39.7	27.9	25.1	30.9
06:00	43.7	38.9	46.0	35.2	29.5	41.1
07:00	48.0	43.9	49.9	42.0	36.5	45.0
08:00	49.7	46.9	53.9	42.9	41.6	44.5
09:00	53.5	45.6	58.4	43.0	40.4	51.9
10:00	53.5	43.7	62.9	41.5	37.3	45.4
11:00	59.3	50.3	65.9	48.4	42.3	54.5

9.9 The noise levels measured in close proximity to Woodbarn Farm indicate night-time noise levels reduce to 30.2dB LAeq(1hr) with a minimum 5 minute noise level recorded of 24.7dB LAeq(5m).

**Table 2 Noise level Summary – Homefield Farm**

<b>Position 2</b>						
<b>Time</b>	<b>LAeq (dB)</b>			<b>LA90 (dB)</b>		
<b>(hh:mm)</b>	<b>Av (1h)</b>	<b>Min (5m)</b>	<b>Max (5m)</b>	<b>Av (1h)</b>	<b>Min (5m)</b>	<b>Max (5m)</b>
15:00	-	-	-	-	-	-
16:00	56.6	53.9	62.3	47.3	44.6	49.3
17:00	54.9	53.7	55.9	48.7	46.5	50.4
18:00	53.8	50.9	56.1	45.2	43.2	47.6
19:00	51.2	48.5	54.5	40.6	35.0	45.3
20:00	49.7	47.0	51.7	36.9	32.5	44.2
21:00	47.2	38.6	49.7	35.7	33.0	40.0
22:00	46.2	37.3	49.0	34.1	31.3	39.4
23:00	44.8	34.2	50.1	32.1	30.1	37.7
00:00	43.4	30.0	51.5	29.9	29.1	31.6
01:00	39.3	30.4	46.0	30.3	29.6	31.0
02:00	37.0	30.0	43.7	29.9	29.4	30.6
03:00	33.9	30.0	40.1	29.5	29.2	29.8
04:00	38.2	30.3	43.7	30.3	29.5	31.8
05:00	42.6	38.5	45.7	31.5	30.7	33.0
06:00	50.5	46.3	53.3	38.6	33.3	45.6
07:00	53.4	49.2	54.5	46.4	41.0	48.6
08:00	54.2	51.9	55.1	46.8	43.9	48.8
09:00	52.3	51.0	54.7	44.0	39.1	48.1
10:00	52.3	49.7	54.2	44.0	39.4	46.9
11:00	51.7	51.2	52.8	41.6	39.3	44.9

9.10 The noise levels measured in close proximity to Homefield Farm indicate night-time noise levels reduce to 33.9dB LAeq(1hr) with a minimum 5 minute noise level recorded of 30.0dB LAeq(5m).

### **Likely Significant Effects**

9.11 This addendum focuses on night time activities and therefore only considers Phase 2b of the construction, comprising operation of the drill rig – the only phase that will be undertaken 24hrs per day. Refer to the Environmental Statement Noise Chapter for an assessment of the other phases.

#### *Significance Criteria*

9.12 Noise levels generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65

dB, 55 dB and 45 dB LAeq, for the daytime, evening and night-time periods, respectively.

**Phase 2b – Operation of the drill rig**

**9.13 Table 3** presents the predicted noise levels from phase 2b works at the closest Noise Sensitive Premises to the Application Site.

**Table 3: Calculated noise levels from on-site works at noise sensitive premises – Phase 2b**

<b>Noise Sensitive Premises</b>	<b>Phase 2b dB LAeq,T</b>
Gatewick Farm	42
Gay Street Farm	38
Homefield Farm	42
Woodbarn Farm	39

9.14 Phase 2b, the operation of the drill rig, will continue 24 hours per day for the duration of the drilling: 6 to 10 weeks. A comparison to the measured baseline noise levels is provided below.

**Table 3: Comparison of noise levels from on-site works at noise sensitive premises – Phase 2**

<b>Noise Sensitive Premises</b>	<b>Lowest Measured Noise Level</b>		<b>Phase 2b</b>
	<i>dB LAeq,1h</i>	<i>dB LAeq,5m</i>	<i>dB LAeq,T</i>
Homefield Farm	34	30	42 (+8, +12)
Woodbarn Farm	30	25	39 (+9, +14)

9.15 At Homefield Farm the predicted noise levels arising from drilling operations are 8dB above the lowest measured 1 hour LAeq and 12dB above the lowest measured 5 minute LAeq noise level.

9.16 At Woodbarn Farm the predicted noise levels arising from drilling operations are 9dB above the lowest measured 1 hour LAeq and 14dB above the lowest measured 5 minute LAeq noise level.

9.17 Both these noise level increases imply a significant increase in noise level at nearby receptors, considered to be a short-term **major adverse impact** and mitigation measures should be considered.

## Noise limits

9.18 BS 5288 provides guidance on suitable noise limits for night-time construction related activity and stipulates a lower limit of 45dB LAeq. BS 4142 provides a method of determining the likelihood of complaints due to a noise source by comparing the background noise level (LA90) to the level of noise from the source in question. It provides the following guidance:

- A difference of around +10dB or more indicates that complaints are likely;
- A difference of +5dB (A) is of marginal significance;
- A difference of -10dB is a positive indication that complaints are unlikely.

9.19 Although the scope of BS4142 defines that:

*'The method is not suitable for assessing the noise measured inside buildings or when the background and rating noise levels are both very low. NOTE. For the purposes of this standard, background noise levels below about 30 dB and rating levels below about 35 dB are considered to be very low.'*

9.20 Background noise levels (LA90) are measured beneath 30dB consistently at both locations during the night-time period, and therefore lies outside the scope of BS 4142.

9.21 The rating (source) noise level of 35dB LAeq is considered to be a reasonable night-time noise limit for the purposes of this assessment.

### Mitigation

9.22 Mitigation measures in the form of screening, barriers or earth forms/bunding are proposed to provide a reduction of the noise levels generated by the drilling activity at night-time. It is proposed that earth bunding will be implemented along the access track and the northern and eastern boundaries of the site. A partial screening from the noise source may provide 5dB attenuation and a complete screening will provide up to 10dB of noise reduction.

**Table 4: Mitigated Noise levels– Phase 2**

Noise Sensitive Premises	Lowest Measured Noise Level		Phase 2b
	dB LAeq,1h	dB LAeq,5m	dB LAeq,T
Homefield Farm	34	30	32 (-2, +2)
Woodbarn Farm	30	25	29 (-1, +4)

- 9.23 The calculated noise levels assume a source noise level of 109dB(A) LW. However this may drop by up to 2-3dB if the auxiliary generator and centrifuge are omitted from the rig equipment.
- 9.24 The Control of Pollution Act<sup>3</sup> and British Standard 5228<sup>4</sup> define a set of Best Practice working methods and mitigation measures, referred to as Best Practicable Means (BPM). Applying these measures will further reduce the noise impact of the proposed works. Examples of these measures are:
- Where possible, locating plant so that it is screened from receptors by on-site structures, such as site cabins;
  - Using mobile screening to shield receptors from particularly noise equipment/activities;
  - Using the modern, quiet equipment and ensuring such equipment is properly maintained and operated by trained staff;
  - Applying silencers/enclosures to particularly noise equipment where possible;
  - Ensuring that mobile plant is well maintained such that loose body fittings or exhausts do not rattle or vibrate;
  - Ensuring plant machinery is turned off when not in use;
  - Keeping local residents informed of the type and timing of works and any particularly noisy operations expected or out of hours working; and
  - Provide local residents with 24-hour contact details for a site representative in the event that disturbance due to noise from the construction works is perceived.
- 9.25 In addition, it is recommended that noise monitoring is undertaken throughout the lifespan of the Proposed Development, to ensure that noise from the site does not exceed the noise limits used within this assessment. Monitoring should be undertaken during the various phases of the Proposed Development and should include any night-time works. It is recommended that the locations for monitoring are the four noise sensitive premises used within this assessment.

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<sup>3</sup> Great Britain (1974) '*Control of Pollution Act*', HMSO, London

<sup>4</sup> British Standards Institution (2009) '*British Standard 5228: Code of practice for noise and vibration control on construction and open sites - Part 1: Noise*', BSI, London.

9.26 Effective implementation of complete screening of the noise source with earth bunds and application of the above mitigation measures will result in **negligible** impact at the noise sensitive receptors.

**Figure 1 Noise Monitoring Locations**

