

Acoustic Associates Sussex Ltd

# Review of a Noise Impact Assessment relating to a Proposed Oil and Gas Exploration Site

Site: Land South of Boxal Bridge, Kirdford Road, near Wisborough Green, West Sussex

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Date : 17<sup>th</sup> June 2014

Planning Ref: WSCC/083/13/KD



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## **Introduction**

This document provides a review of a Noise Impact Assessment, which itself forms Chapter 9 of the Environmental Statement, dated July 2013, provided in support of the application by Celtique Energie Weald Ltd. Chapter 9 was prepared by ACIA Engineering Acoustics, Stockport on behalf of the Applicant.

The Environmental Statement is provided under The Town and Country Planning (Environmental Impact Assessment) Regulations 2011 in support of an application for the development of an exploratory well site, for the exploration, testing and evaluation of hydrocarbons, on Northup field, south of Boxal Bridge, Kirdford Road, Wisborough Green, West Sussex.

This review covers the acoustic aspects of the application.

## **General Comments**

The noise assessments provided in the form of the documents:

- a) Chapter 9.0 Noise and Vibration and
- b) Additional Information Chapter 9.0A Noise and Vibration

as a part of the Environmental Statement have been examined and the following points have been considered:

- i) the appropriateness of the Standards and guidance documents used. A number of documents and Standards are referenced, including:
  - National Planning Policy Framework, 2012
  - Technical Guidance to the NPPF, 2012
  - Planning Practice Guidance, 2014
  - Noise Policy Statement for England, 2012
  - The West Sussex Minerals Local Plan, 2003
  - Chichester District Council Local Plan, 1999
  - BS5228:2009: Code of practice for noise and vibration control on construction and open sites
  - ISO 9613-2:1996: Attenuation of sound during propagation outdoors
  - Report of the Noise Review Working Party, Department of the Environment, October 1990
  - Hampshire County Council ISVR Report
  - Design Manual for Roads and Bridges: Vol 11: Rev.2011
  - Calculation of Road Traffic Noise: 1988: Department of Transport
  - BS7385-2: 1993: Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration
  - Environmental Protection Act, 1990
  - Control of Pollution Act, 1994
- ii) the methodology employed for the noise assessment
- iii) the noise levels predicted to be 'received' at the positions of the nearest noise-sensitive receptors (NSRs), e.g residential properties
- iv) the recommended noise limits at the NSRs and how the predicted noise levels compare with these
- v) the depth of information provided regarding the plant and equipment that will operate at the Well Site and regarding the road traffic that will be associated with
  - a) Phase 1: Construction of the access road and well site
  - b) Phase 2: Mobilisation of drill rig and drilling operations
  - c) Phase 3: Testing (gas and oil)

- d) Phase 4a: Restoration, or  
Phase 4b: Retention
- vi) given the above, whether the scheme is acceptable in terms of noise emissions
- vii) possible planning conditions that could be attached to the scheme to ensure that noise emissions were acceptable, were Planning Permission to be granted.

The Standards that have been referred-to in the preparation of the Environmental Statement are considered to be appropriate to the nature of the proposed development and its potential impact upon nearby noise-sensitive receptors (NSRs).

The methodology has included calculation of predicted noise levels at the closest NSRs, arising at both the construction and well test phases and including computer modelling of the proposed well test site and its surroundings. It also includes the preparation of a Transport Assessment and, based upon this, the assessment of the noise impact of vehicle movements including, in particular, HGV movements associated with the construction and well test phases of the development.

The above methodology is considered to be appropriate for the proposed development.

### The Appropriateness of the Noise Criteria Used

**Table 9.2:** Proposed noise limits at noise-sensitive locations, dB

activity	daytime $L_{Aeq,1h}$	evening $L_{Aeq,5min}$	night $L_{Aeq,5min}$
construction	55	N/A	N/A
drilling	55	42	42
short-term testing	55	42	42
extended well test*	40*	35*	35*
site reinstatement restoration	55	N/A	N/A

\* applicable at **Application Site** site boundary

The noise limits set out in table 9.2 above (reproduced from the Application document Chapter 9A: Noise and Vibration) are either in accordance with the recommendations of the Standards referred to above or are set at levels which are lower than required by those Standards.

Additionally, the proposed limits for evenings and night-time are based upon  $L_{Aeq,5min}$  values, rather than the  $L_{Aeq,1hr}$  values that are recommended by the Planning Practice Guidance 2014 (PPG) document; Paragraph 021. Since this represents an energy-average value over the 1 hour or 5 minute periods; Paragraph 021. Since this represents an energy-average value over the 1 hour or 5 minute periods, this means that any slight exceedences of the noise criterion that might make little difference to a  $L_{Aeq,1hr}$  value would show up more significantly with a  $L_{Aeq,5min}$  value. Therefore, the  $L_{Aeq,5min}$  criterion, as proposed, is a tighter criterion than that required by the PPG document and provides more protection from noise for nearby NSRs.

The proposed noise limits, as set out in table 9.2 above, are considered to be acceptable in general. However, a separate noise limit and a separate noise level condition are proposed below to deal with noise from the gas flare during the extended well test phase.

## **Executive Summary**

The information provided in the Noise Impact Assessment prepared on behalf of the Applicant has been reviewed.

It is concluded on the basis of the information provided that the predicted noise levels from the oil and gas exploration site on Land South of Boxal Bridge, near Wisborough Green, satisfy the normal noise level criteria that would be applied in a case of this nature.

The noise emitted from the development is considered to be acceptable with reference to the relevant applicable standards, subject to a series of noise conditions.

## **Further Information**

Further information is provided below dealing with each of the phases in turn and commenting upon the predicted noise levels resulting from the activities on site and vehicle movements on nearby roads.

### **Construction Phase (up to 10 weeks)**

According to the noise predictions provided for construction activities, it is likely that noise from the site will be audible at some times at the closest NSRs. However, the levels are predicted (at  $L_{Aeq,1hr}$  41dB, worst-case) to be significantly below the criteria set out in Planning Practice Guidance – 2014; paragraph 022 which, for the construction phase, would permit increased temporary daytime limits of up to  $L_{Aeq,1hr}$  70dB (free-field) for up to 8 weeks per year at NSRs.

The proposed noise limit value of  $L_{Aeq,1hr}$  55dB during the construction phase, which is predicted to last between 6 – 10 weeks, actually accords with the maximum noise level criterion provided in the PPG document (para.021) for normal operations. Thus, compliance with this noise limit will satisfy both the construction and the normal operations phases.

Work is programmed to take place during extended daytime working hours only (07:00 – 19:00 hrs weekdays and 08:00 – 13:00 hrs on Saturdays). Therefore, noise limits for evening and night activities are not applicable.

### **Vehicle Movements (construction phase)**

The road traffic noise levels will increase slightly during weekday daytime hours and on Saturday mornings for nearby noise sensitive receptors (NSRs). This will result mainly from the passage of HGVs. The degree of increase during these times, however, is predicted to be below 1dB, i.e. below the threshold of what is normally taken to be the smallest significant noise change.

It is likely, however, that HGV pass-by events will be audible during the short duration of each event; predicted to be around 5-6 two-way movements per hour during the normal working day and on Saturday mornings

In summary, there **will** be noticeable noise from HGV movements at times and for the durations of the HGV pass-by events. However, the predicted increase in road traffic noise levels will be less than 1dB and are, therefore, considered to be insignificant in accordance with the guidance of the Design Manual for Roads and Bridges.

### **Rig Mobilisation and Drilling Phase (14-26 weeks)**

During the Rig mobilisation phase, the noise levels are predicted to be no higher than during the construction phase.

During the subsequent drilling phase, involving 24-hour operations, the worst-case noise level from drilling operations is predicted to be  $L_{Aeq,T}$  38dB. It is acknowledged in the consultant's report on behalf of the Applicant that, on a calm night, this is likely to exceed background noise levels by around 14dB.

Set against this, it should be taken into account that, on a night with some wind, even as low as 3-5m/s, the background noise level would increase to some degree and it is likely that the degree of exceedence of background level would reduce.

The worst-case noise level is, however, below the night noise criterion level of  $L_{Aeq,1hr}$  42dB provided by the Planning Practice Guidance document for noise from minerals extraction sites.

This phase of work is likely to extend to a maximum of 14 weeks for vertical drilling, with a possible 12 weeks for lateral drilling thereafter if this is deemed to be appropriate.

### **Vehicle Movements (rig mobilisation and drilling phase)**

The road traffic noise levels will increase slightly during weekday daytime hours and on Saturday mornings for nearby noise sensitive receptors (NSRs). This will result mainly from the passage of HGVs. The degree of increase during these times, however, is predicted to be below 1dB, i.e. below the threshold of what is normally taken to be the smallest significant noise change.

It is likely, however, that HGV pass-by events will be audible during the short duration of each event.

During the rig mobilisation phase (approx. 1 week), It is predicted that there will be around 3 two-way movements per hour during the normal working day and on Saturday mornings.

During the drilling phase, it is predicted that there will be around six movements of HGVs daily plus around 38 movements of light vehicles, most of which will occur at shift changeover periods around 8am and 8pm daily.

### **Vehicle Movements (rig demobilisation phase – 1 week)**

Vehicle movements will be similar to those during the rig mobilisation phase.

## Well Test Phase

Noise levels at NSRs are predicted to be similar to those during the drilling phase for the first 2 weeks of the well test phase.

Thereafter, the extended well test phase, which could run for up to 26 weeks and will involve 24-hour operations, will involve the installation of a number of production facilities. These are set out in paragraph 9.78 of the document Chapter 9A Noise and Vibration. The list is reproduced here for clarity:

- Storage tanks for produced oil and formation water contained in a bunded area;
- An oil/water/gas separator for the separation of the produced well stream, also contained within the bunded area;
- Transfer pumps to transfer fluids between the storage tanks and also to road tankers for export;
- A flare stack to vent or flare any produced gases;
- A pumping unit on the well to produce (it is unlikely that the oil will flow to surface naturally);
- An emergency shutdown system on the well to stop production and shut-in the well in the event of an emergency;
- Portacabin offices to house the pumping unit control equipment and provide an office and facilities for the well operators;
- A packaged electrical generator.

The predicted noise level during this phase of operations, with the exception of the gas flare, is a worst-case level of  $L_{Aeq,5min}$  16dB. This is significantly below the background noise levels outside any of the NSRs, even on a calm night and is likely to be virtually inaudible and, therefore, acceptable.

The Applicant and his consultants have provided information regarding predicted noise levels from the gas flare. At normal anticipated gas flow rates during the daytime, the predicted level at the closest NSR will be approximately 25dBA. Any exceedence of this value would occur only in an emergency. The Applicant has also confirmed that the gas flare would only operate between the hours of 08:00 – 20:00 hours and never at night.

The predicted noise levels from the exploration site during the long-term well test phase are within the proposed noise limits at the exploration site boundary, with the exception of the noise from the gas flare.

The noise from the gas flare will occur only during daytime hours 08:00 – 20:00 hrs. During these times, the noise from this source, as received at the closest NSR, will be significantly below the ambient noise levels (at a predicted 25dBA approx.). However, it is possible that the noise from this source may exceed the noise limit criteria set out in table 9.2 above. It is therefore proposed in the section below, dealing with proposed noise conditions in the event of a grant of planning consent, that this item be covered by a separate noise condition.

### **Vehicle Movements (well test phase)**

It is predicted that, during this phase, there would be approximately 44 vehicle movements daily, of which around 6 would be HGVs. It is confirmed that the resulting increase in noise levels from road traffic is predicted to be no worse than during the drilling phase (see above).

### **Site Restoration Phase**

It is predicted that, during the site restoration phase, the noise levels at the closest NSRs will be no worse than during the construction phase.

### **Conclusions**

In conclusion, it is considered that:

- the methodology used to assess noise emissions was appropriate;
- the development would not result in significant noise emissions during any of the operations set out;
- the development would be acceptable, in noise terms, subject to the imposition of conditions.



### **Proposed Noise Conditions in the event that Planning Permission is granted**

If the Planning Application for the oil and gas exploration site on Land South of Boxal Bridge is granted consent then it is recommended that appropriate noise conditions be attached to such consent. This will ensure adequate and continued protection from noise for occupiers of nearby Noise Sensitive Premises.

Appropriate wording for Conditions could be as follows:

#### **Construction, Rig Mobilisation and Site Restoration Phases:**

Noise from construction activities or during the rig mobilisation or site restoration phases associated with the proposed Oil and Gas Exploration Site shall not exceed a level of

$L_{Aeq,1hr}$  55dBA between the hours of 07:00 – 19:00 Monday to Friday and 08:00 – 13:00 Saturday

at the boundary of any of the existing noise sensitive properties close to the site

#### **Drilling Phase:**

Noise from drilling activities associated with the proposed Oil and Gas Exploration Site shall not exceed a level of

$L_{Aeq,1hr}$  55dB between the hours of 07:00 – 19:00

$L_{Aeq,5min}$  42dB between the hours of 19:00 – 22:00

$L_{Aeq,5min}$  42dB between the hours of 22:00 – 07:00

at the boundary of any of the existing noise sensitive properties close to the site

#### **Short Term Test Phase (approx 2 weeks)**

Noise from the short term test phase, following the drilling phase but prior to the extended well test, associated with the proposed Oil and Gas Exploration Site shall not exceed a level of

$L_{Aeq,1hr}$  55dB between the hours of 07:00 – 19:00

$L_{Aeq,5min}$  42dB between the hours of 19:00 – 22:00

$L_{Aeq,5min}$  42dB between the hours of 22:00 – 07:00

at the boundary of any of the existing noise sensitive properties close to the site

#### **Extended Well Test Phase**

Noise from the extended well test phase associated with the proposed Oil and Gas Exploration Site shall not exceed a level of

$L_{Aeq,1hr}$  40dB between the hours of 07:00 – 19:00

$L_{Aeq,5min}$  35dB between the hours of 19:00 – 22:00

$L_{Aeq,5min}$  35dB between the hours of 22:00 – 07:00

as measured at the boundary of the Application site

#### **Gas Flaring**

Noise from gas flaring shall not exceed a level of  $L_{Aeq,1hr}$  55dB at any position along the north or south boundary of the Application site, when measured in direct line of sight to the Clean Enclosed Burner (CEB) flare.

### **All Noise Conditions**

A 5dB correction shall be added to the measured  $L_{Aeq,T}$  noise level to provide a corrected noise level if one or more of the following features occur:

- the noise contains a distinguishable, discrete, continuous note (whine, hiss, screech, hum, etc.);
- the noise contains distinct impulses (bangs, clicks, clatters or thumps)
- the noise is irregular enough to attract attention

The corrected noise level shall then comply with the noise conditions set out above.

### **Noise Level Monitoring**

Noise levels shall be continuously monitored and recorded at the site boundary from the date of the commencement of development. The results of the monitoring shall include LA90 and LAeq noise levels, the prevailing weather conditions, details and calibration of the equipment used for measurement and comments on other sources of noise which affect the noise climate. The results shall be submitted to the County Planning Authority on a weekly basis or upon request by the County Planning Authority. If the results indicate that the noise levels exceed those set out in the noise conditions set out above, mitigation shall be implemented within 48 hours to ensure compliance with the noise conditions.

### **Noise Management Plan**

Prior to the commencement of development, the applicant shall submit to, and have approved in writing by the County Planning Authority a Noise Management Plan. The Plan shall identify:

- Details of initial noise tests for each item of noise-emitting plant on site to establish whether noise emissions are compliant with the above conditions;
- If not compliant, details of what mitigation would be introduced and timescales for implementation;
- Details of instantaneous mitigation methods for each item of noise-emitting equipment (e.g. throttling back gas flow for the flare, stopping works where safe to do so) and any longer term mitigation;
- Detail of continuous monitoring procedure to monitor noise limits;
- Procedures for addressing any complaints received.

Once approved, the Noise Management Plan shall be implemented in full throughout the course of the development.

Reason: To protect the amenities of local residents.