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**Proposed Drilling Site  
Near St Nicholas  
Vale of Glamorgan**

**Noise Impact Assessment  
3082/ENS1\_rev2**

15<sup>th</sup> April 2013

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## 1.0 Introduction

Coastal Oil & Gas Ltd is proposing to drill on land approximately 2.75km south of St Nicholas and 450m east of the A4226 road. Drilling is proposed to take place 24 hours a day for approximately 6 weeks.

Hunter Acoustics have been commissioned to monitor background noise levels prior to the drilling taking place, in order to propose noise limits at critical noise sensitive premises.

Appendix A explains acoustic terminology used in this report.

## 2.0 Planning Guidance

### 2.1 Minerals Technical Advice Note (Wales) 1

The Minerals Technical Advice Note (Wales) 1 (MTAN1) document gives the following guidance on noise limits for mineral extraction including gas:

- Daytime (0700-1900hrs) noise limits at noise-sensitive properties should be established at 10dB(A) above background levels\* (subject to a maximum of 55dB(A) LAeq,1h).;
- Evening (1900-2200hrs) noise limits at NSPs should be established at 10dB(A) above background levels;
- Night-time noise limits at noise-sensitive dwellings should not exceed 42dB(A) LAeq,1h.

\* Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit should be set as near that level as practicable and should not exceed 55dB(A)

MTAN1 also recognises that when developing noise limits, some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction.

### 2.2 World Health Organisation Guidance (residential receivers)

The World Health Organisation (WHO) 'Guidelines for Community Noise – 1999' quotes sleep disturbance limits in bedrooms at night of LAeq,8hr 30dB(A).

### 3.0 Environmental Noise Survey

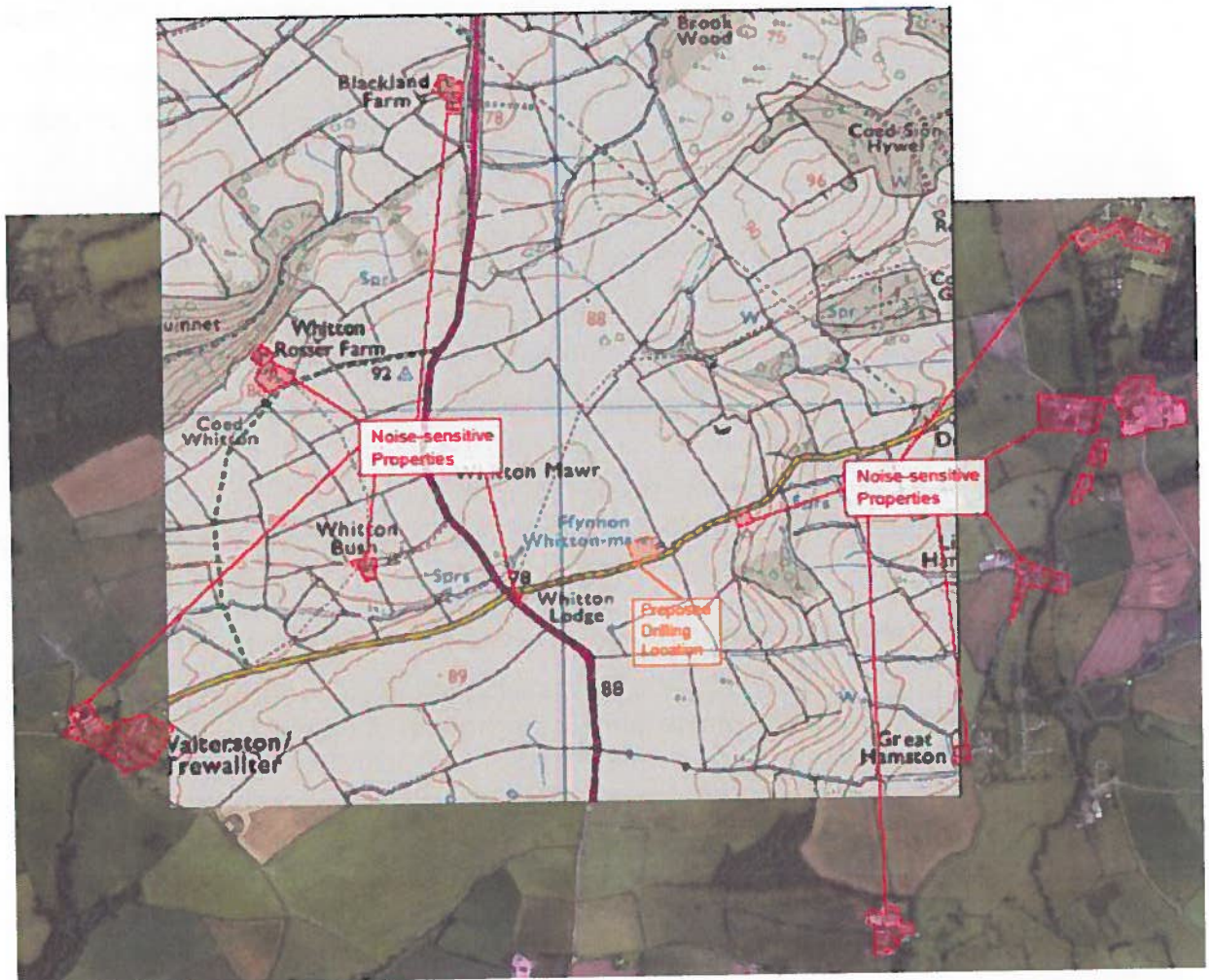
#### 3.1 Procedure

Continuous noise monitoring was carried out between 1530hrs on 28<sup>th</sup> February and 1500hrs on 1<sup>st</sup> March 2013 to determine existing background noise levels. Data including  $L_{max}$ ,  $L_{eq}$  &  $L_{90}$  was logged at 5-minute intervals over the monitoring period.

Site plan 3082/SP1 shows the development site and the measurement position used;

**Position A** Located on fence near centre of proposed drilling site, approximately 1.2 - 1.5m above local ground level. Background noise levels at this location are deemed representative of those at the nearest noise sensitive premises.

#### 3082/SP1 - Site Plan Showing Monitoring Position



### 3.2 Equipment Used

The following equipment was used:

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.
Rion	Type 1 - Sound Level Meter	NL-32	01103396	25-Feb-13	1302066
Rion	Preamplifier	NH-21	34335	25-Feb-13	1302066
Rion	Microphone	UC-53A	317921	25-Feb-13	1302066
Norsonic AS	Calibrator (114.09 dB @ 999.68 Hz)	1251	31429	27-Jul-12	U11716

The measurement systems were calibrated before and after the survey. No variation occurred.

### 3.3 Weather Conditions

Weather conditions during the survey were dry and mild with light winds.

## 4.0 Results

Time history graph 3082/TH1 shows  $L_{max}$ ,  $L_{eq}$  &  $L_{90}$  sound pressure levels measured over consecutive 5-minute periods at position 1.

Period	Minimum Consistent $L_{90}$	Proposed Noise Limit
Daytime (0700-1900)	37.2dB(A)	47.2dB(A)
Evening (1900-2200)	37.2dB(A)	47.2dB(A)
Night (2200-0700)	26.0dB(A)	42.0dB(A)

Time history graph 3082/TH1 shows  $L_{max}$ ,  $L_{eq}$  &  $L_{90}$  sound pressure levels measured over consecutive 5-minute periods at position A.

As the drill rig is proposed to operate 24 hrs/day during the 6 week period, night-time is the critical period when setting noise limits.

## 5.0 Noise Predictions

### 5.1 Noise Sensitive Properties

Locations of critical noise properties are shown in site plan 3082/SP1.

The nearest critical noise sensitive properties appear to be houses located approximately

- 280m east (Little Hamston Farm)
- 320m west (Whitton Lodge)
- 650m west (Whitton Bush)

of the proposed drill site. Other NSPs appear to be at least 1km away.

### 5.2 Predicted Noise Levels

The proposed drill rig has a typical noise level of 79 dB(A) at 1m – based on data included in an email from Oliver Taylor dated 21/01/2011 with manufacturer's specifications for a similar drill rig and our own measurements of a similar drill rig.

Taking a distance loss of

- 280m east, the noise level of the drill rig at the residence is predicted to be approximately 39.6dB(A)  $L_{Aeq}$ .
- 320m west, the noise level of the drill rig at the residence is predicted to be approximately 38.4dB(A)  $L_{Aeq}$ .
- 650m east, the noise level of the drill rig at the residence is predicted to be approximately 32.3dB(A)  $L_{Aeq}$ .

*Note: These predictions do not account for any soft ground absorption or screening losses that are likely to occur and can therefore be classed as a worst case prediction.*

These levels meet the night-time limits set in MTAN1.

Allowing for a 15dB loss through a partially open window should result in noise levels in bedrooms below the World Health Organisation (WHO) night-time sleep disturbance noise criteria of 30dB(A).

## **6.0 Good Practice Guide**

The following advice is given with the aim of reducing noise associated with the drilling operations by means of good practice.

A summary of the practical measures in the choice and use of plant to reduce noise is given below:

- Avoid unnecessary revving of engines and switch off equipment when not required.
- Ensure plant and vehicles are properly maintained, check silencers and bearings.
- If the noise is directional, point the source away from noise-sensitive locations.
- Limit the use of particularly noisy plant or vehicles.
- Start up plant sequentially rather than together.
- Ensure plant is operated with noise control hoods closed.

## 7.0 Conclusion

Coastal Oil & Gas Ltd is proposing to drill on land approximately 2.75km south of St Nicholas and 450m east of the A4226 road. Drilling is proposed to take place 24 hours a day for approximately 6 weeks.

Critical noise sensitive premises have been identified as shown on Site Plan 3082/SP1.

Background noise levels have been measured at a location that can be deemed to have a noise climate representative to that at the critical noise sensitive premises.

Noise limits have been proposed based on measured background noise levels and current planning guidance.

Predicted noise levels are indicated to fall below MTAN1 night-time noise limits and the World Health Organisation (WHO) night-time sleep disturbance threshold criteria of 30dB(A) within bedrooms.

Noise limits and criteria should be confirmed acceptable with the local planning authority/EHO.

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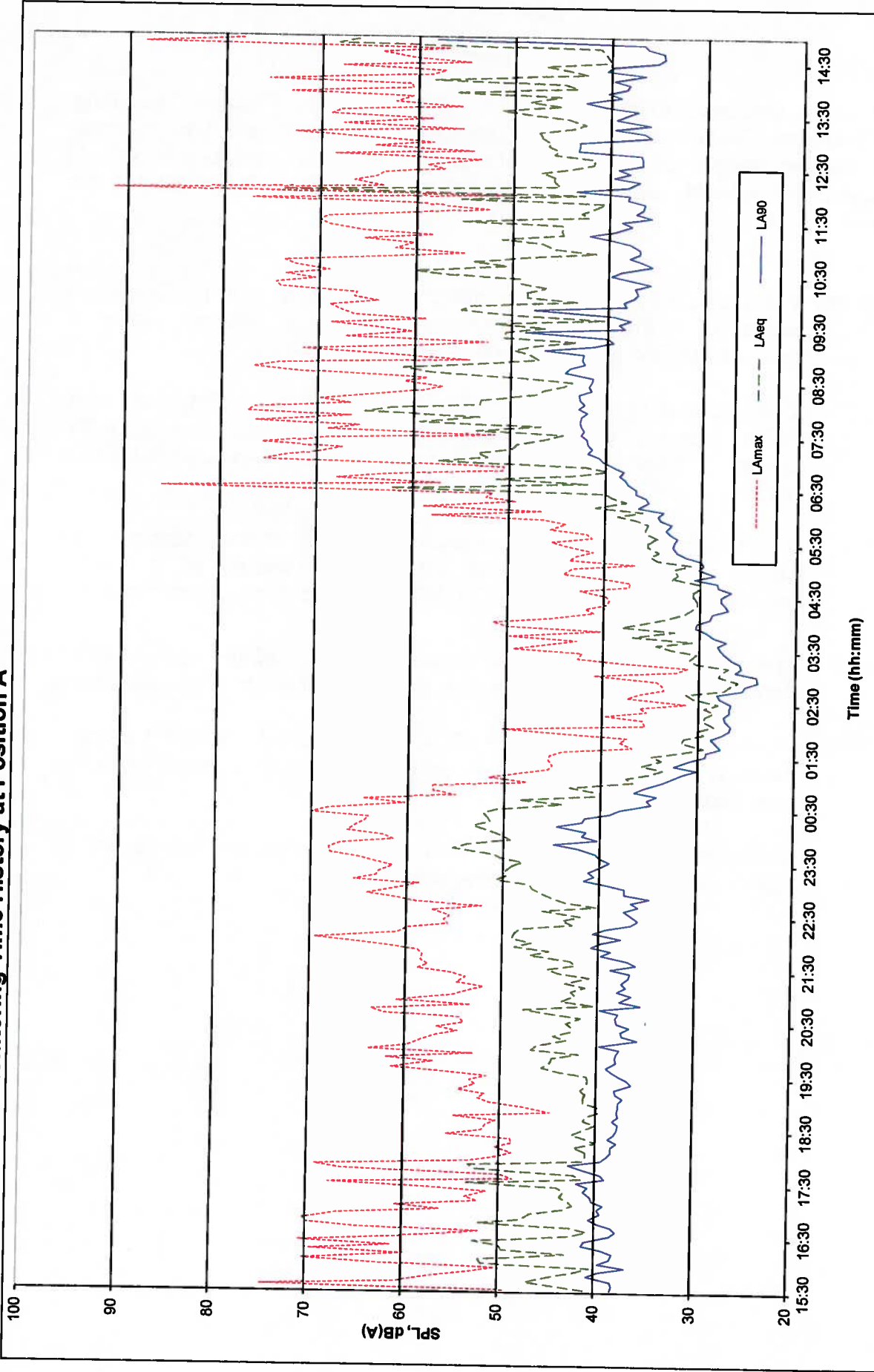
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3082/TH1 - Continuous Monitoring Time History at Position A



## Appendix A

### Acoustic Terminology

Human response to noise depends on a number of factors including; Loudness, Frequency content, and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'. The following units have been used in this report:

**dB(A):** The sound pressure level weighted to correspond with the frequency response of the human ear, and therefore a persons subjective response to frequency content.

**L<sub>eq</sub>:** The Equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.

**L<sub>90</sub>:** The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1-hour measurement. It is often used to define the background noise level.

**L<sub>10</sub>:** The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6 minutes of a 1-hour measurement

**SEL:** 'Sound Exposure Level', The dB(A) level which, if it lasted 1 second, would produce the same sound energy as the event in question (e.g. a train pass-by).

**L<sub>Af,Tr</sub>:** Rating noise level is the specific noise level plus any adjustment for the characteristic features of the noise