

Noise Management Plan

Broadford Bridge

Celtique Energie

21 August 2014

Final Report



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CONTENTS

| | Page |
|---|------|
| 1 INTRODUCTION | 2 |
| 2 GUIDANCE | 3 |
| 3 RECEPTOR AND ASSESSMENT RESULTS | 4 |
| 3.1 Phase 1 Construction Noise Assessment Results | 4 |
| 4 PHASE 1: CONSTRUCTION NOISE MONITORING SCHEME | 5 |
| 4.1 Purpose | 5 |
| 4.2 Noise Sensitive Locations | 5 |
| 4.3 Responsibilities for Construction Noise Management | 5 |
| 4.3.1 Management Structure and Responsibilities | 5 |
| 4.4 Construction Noise Control Measures | 6 |
| 4.5 Noise Monitoring Equipment | 6 |
| 4.6 Noise Monitoring Methodology | 7 |
| 4.7 Frequency of Measurements | 7 |
| 4.8 Reporting | 7 |
| 4.9 Non-compliance with Noise Limits/Receipt of Complaint | 8 |
| 4.10 Data Retention | 8 |
| 5 PHASE 2, 3 & 4: OPERATIONAL NOISE MANAGEMENT PLAN | 13 |
| 5.1 Operational Noise | 13 |
| 5.2 Noise Sensitive Locations | 13 |
| 5.3 Responsibilities for Operational Noise Management | 14 |
| 5.3.1 Management Structure and Responsibilities | 14 |
| 5.4 General Noise Control Measures | 15 |
| 5.5 Noise Monitoring Equipment | 15 |
| 5.6 Noise Monitoring Methodology | 15 |
| 5.7 Reporting | 16 |
| 5.8 Non-compliance with Noise Limits/Receipt of Complaint | 16 |
| 5.9 Training | 17 |
| 5.10 Maintenance | 17 |
| 5.11 Communications | 17 |
| 5.11.1 Contact Information | 17 |
| 6 ACTION PLANS | 19 |

Appendix 1 Permitting Documentation: Site Condition Report and Management & Monitoring Plan March 2014

1 INTRODUCTION

Royal HaskoningDHV has been instructed by Celtique Energie to draft a Noise Management Plan for the proposed Broadford Bridge development at Wood Barn Farm, Adversane Lane, Broadford Bridge, Billingshurst, West Sussex. The proposals comprise exploration for hydrocarbons and the analysis of any found. The Noise Management Plan is required to satisfy Condition 8 of the planning permission issued by Horsham District Council referenced WSCC/052/12/WC.

Condition 8 states that:

Prior to the commencement of development, a Noise Management Plan shall be submitted to the County Planning Authority for approval in writing. The plan shall detail the monitoring of the site throughout the phases of development, including night-time working and shall be implemented upon approval for the duration of the permission. Should subsequent noise surveys establish the limits (which are specified within Chapter 9 of the Environmental Statement) are being exceeded; details for further mitigation and a timetable for implementation will be submitted to the County Planning Authority for approval. Upon approval from the County Planning Authority, the mitigation will be installed and retained for the duration of the permission.

Reason: In the interests of the amenities of the residents of the locality; to ensure that noise from the site does not exceed the noise limits set out in the Environmental Statement.

The report outlines the possible noise impacts generated during construction and operation of the proposed gas/oil exploration facility and details the monitoring, control and mitigation measures which will be employed to reduce and/or minimise impacts.

The phases of development are as follows:

- **Phase 1** **Construction**
- **Phase 2** **Mobilisation and drilling**
- **Phase 3** **Testing**
- **Phase 4** **Restoration or Retention**

The County Planning Authority have primacy in approving this plan but, as part of its Mining Waste Permit submission to the Environmental Agency, Celtique Energie were requested to provide a summary of this plan. This summary information is contained in Section 5 of the Broadford Bridge “Site Condition Report and Management & Monitoring Plan” (document reference HSEC-BB-P-03). For consistency and to ensure full transparency, this documentation is also contained as Appendix 1 of this document.

2 GUIDANCE

In order to define the “standard day time construction and operational and night-time decibel levels”, as required by Condition 8, the relevant guidance is summarised below:

British Standard (BS) 7445: Parts 1 and 2 - Description and measurement of environmental noise¹. The Standard provides details of the instrumentation and measurement techniques to be used when assessing environmental noise, and defines the basic noise quantity as the continuous A-weighted sound pressure level (LAeq). Part 2 of BS 7445 replicates ISO standard 1996-2.

British Standard (BS) 5228: Code of practice for noise and vibration control on construction and open sites - Part 1². This document provides recommendations for basic methods of noise and vibration control relating to construction and open sites where work activities/operations generate significant noise and/or vibration levels. The legislative background to noise and vibration control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. This British Standard provides guidance on methods of predicting and measuring noise and assessing its impact on those exposed to it.

World Health Organisation (WHO) Guidelines for community noise³. These guidelines present health-based noise limits intended to protect the population from exposure to excess noise. It presents guideline limit values at which the likelihood of particular effects, such as sleep disturbance or annoyance, may increase. The guideline values are 50 or 55dB LAeq during the day, related to annoyance, and 45 dB LAeq or 60dB L_{Amax} at night, related to sleep disturbance.

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

² British Standards Institution, (2009). BS 5228-1:2009: *Code of practice for noise and vibration control on construction and open sites - Part 1: Noise*. BSI, London.

³ Berglund et al. (1999) *Guidelines for Community Noise*. Geneva, World Health Organisation (WHO).

3 RECEPTOR AND ASSESSMENT RESULTS

Construction and operational noise assessments were undertaken by RHDHV for the following residential locations for all phases of the proposed development, please also refer to Figure 5-1:

- NS1 Gatewick Farm 751m south west of the site
- NS2 Gay Street Farm 1257m west of the access road to the site
- NS3 Homefield Farm 720m east of the access road to the site
- NS4 Woodbarn Farm 935m north of the access road to the site

3.1 Phase 1 Construction Noise Assessment Results

Tables 3-1 and 3-2 below detail the results of the construction noise assessment taken from Chapter 9 of the Environmental Statement.

Table 3-1 Predicted Construction Noise at Receptors (Phase 1)

| Noise Sensitive Premises | Phase 1 Construction noise <i>dB L_{Aeq,T}</i> | BS5228 Adopted Noise Limit (dB) Daytime (07.00 – 19.00) and Saturday mornings ² | BS5228 Adopted Noise Limit (dB) Evenings & weekends ¹ | BS5228 Adopted Noise Limit (dB) Night-time (23.00 – 07.00) |
|--------------------------|---|--|---|---|
| Gatewick Farm | 47 | 55 | 55 | 45 |
| Gay Street Farm | 43 | 55 | 55 | 45 |
| Homefield Farm | 49 | 55 | 55 | 45 |
| Woodbarn Farm | 48 | 55 | 55 | 45 |

¹ 19.00 – 23.00 weekdays, 13.00 – 23.00 Saturdays and 07.00 – 23.00 Sundays

² 07.00 – 13.00 Saturdays

Table 3-2 Phase 1 – Calculated road traffic noise effects at Receptors (Phase 1)

| Noise Sensitive Premises | Phase 1 <i>dB L_{10,18hr}</i> |
|---|--|
| B2133 Adversane, east of Oakleigh Cottage | 64 |
| B2133 Adversane, south of Woodbarn Farm | 64 |

4 PHASE 1: CONSTRUCTION NOISE MONITORING SCHEME

4.1 Purpose

The purpose of the noise monitoring scheme is to facilitate data acquisition to demonstrate to the local planning authority that the permitted development is being constructed within the guideline noise limits set out in BS5228-1:2009 and in such a manner as to minimise the noise impacts at nearby noise-sensitive receptors.

In the event that the guideline noise limits are breached, the noise monitoring scheme will prompt remedial actions to ensure on-going future compliance.

4.2 Noise Sensitive Locations

For the purpose of monitoring construction noise emissions the nearest properties to the main site and to the access road are considered to be the most noise-sensitive, these are provided in Figure 5-1.

Where possible, the noise monitoring locations selected will allow noise information that is representative of the identified location to be gathered without the necessity to access private land.

Table 3-1 and 3-2 outline the predicted construction noise and associated road traffic noise levels at the four most affected receptors.

4.3 Responsibilities for Construction Noise Management

The responsibility for implementing the construction noise management scheme and monitoring construction noise rests with the main construction contractor. The contractor will operate an Environmental Management System (EMS) consistent with the requirements of ISO 14001.

The Main Contactor will be required to report against the Considerate Constructors Scheme Code of Considerate Practice, designed to encourage best practice beyond statutory requirements.

4.3.1 Management Structure and Responsibilities

The main contractor's Senior Site Manager (or his deputy) will be on site during working hours and will be responsible for robust implementation of noise management and mitigation measures.

The key management roles with regard to the design and implementation of noise control at the construction site are the Project Manager (Celtique Energie) and Senior Site Manager. Their roles will be defined in the site EMS and detailed duties include but are not limited to:

Project Manager: The Project Manager is responsible for implementation of the appropriate Environmental Policy and Sustainability Strategy through:

- compliance with contractual requirements regarding environmental matters;
- approval of the Project Environmental Plan (PEP) and control measures, and participation in regular reviews of the EMS to ensure its continued suitability and effectiveness;
- designate responsibility for environmental control during the works;

- regular meetings with project team members to review environmental matters;
- regular reporting to the employer on environmental matters; and
- ensure adequate resources are made available.

Senior Site Manager: The Senior Site Manager is directly responsible to the Project Manager for the day to day administration of environmental issues. This shall include, but not be limited to:

- managing and advising on environmental matters affecting the Project;
- implementing the EMS on the project;
- reporting to the Project Manager on implementation of the PEP, good environmental practice and sustainability measures;
- carrying out regular internal audits and procedure review on environmental matters;
- review and updating of environmental system procedures and method statements;
- review and mitigate all environmental impacts of method statements;
- record and maintain all environmental matters/incidents in accordance with reporting procedures; and
- ensure all team members work in accordance with the PEP.

4.4 Construction Noise Control Measures

The Control of Pollution Act and British Standard 5228 define a set of Best Practice working methods and mitigation measures, referred to as Best Practicable Means (BPM). 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.

Table 4-3 outlines the demonstration that Best Practicable Means Techniques (BPM) are being adopted to ensure that noise levels during construction operations meet the relevant criteria. The table also includes any additional actions that could be used to help meet BPM.

4.5 Noise Monitoring Equipment

Environmental noise levels shall be measured using sound level meters conforming to Type 1 or better of the latest versions of British Standard EN 61672-1:2003 *Electro-acoustics, Sound Level Meters, Specifications*.

The sound level meters shall be field calibrated before and after monitoring using an acoustic calibrator conforming to the latest version of British Standard EN 60942:2003 *Electro-acoustics – Sound Calibrators*.

All sound level meters shall be calibrated to a traceable standard by a UKAS-accredited laboratory, or equivalent, within a 24 month period before the survey and all acoustic calibrators shall be calibrated to a traceable standard by a UKAS-accredited laboratory, or equivalent, within a 12 month period before the survey.

4.6 Noise Monitoring Methodology

Noise measurements shall be undertaken by a suitably qualified person at the noise sensitive locations identified above. The noise measurements shall be undertaken during a normal working day, during typical working hours, avoiding meal breaks and times when plant and equipment within the site or on the access road are not operational.

Noise levels shall also be measured during a period when the site is not operational, for example during a lunch break or shift change, to enable a comparison to be made between the baseline and construction noise levels.

The sound level meter shall be positioned such that the microphone is located 1.5m above local ground level in free-field conditions, i.e. at least 3.5m from the nearest vertical, reflecting surface, at all survey locations.

Noise levels shall be measured over a one-hour period during the normal working day, or over an appropriate time period if in response to specific complaints or ad hoc requests. Night-time working during Phase 1 activities is not deemed necessary.

A note of the prevailing weather conditions shall be made at the time of the survey and the audibility of the site shall be noted at each measurement location during each measurement period.

4.7 Frequency of Measurements

Noise monitoring shall be flexible in its frequency and should cover all Phase 1 activities with monitoring being undertaken when operations are being undertaken close to the site boundary, i.e. site preparation works, as well as during other routine construction operations.

As a minimum noise monitoring shall be undertaken:

- at a frequency of once every week during Phase 1 operations until it is agreed with the local planning authority that sufficient data has been accumulated to allow agreement that the monitoring frequency can be reduced to once every two to four weeks; and
- immediately after the implementation of any mitigation measures that have been implemented as a result of the Noise Monitoring Scheme or otherwise.

4.8 Reporting

On completion of each noise survey a report shall be prepared and made available in a format suitable for submission to the local planning authority.

The report shall contain, as a minimum:

- the results of the noise survey, i.e. noise levels during construction works and noise levels with the site not working, in terms of L_{Aeq} ;
- details of the instrumentation used including calibration details;
- details of the prevailing weather conditions on the day of the survey;
- details of the audibility of the site;
- details of any extraneous noise sources that influenced the noise climate; and
- details of any noise complaints received and actions taken to address the complaints.

4.9 Non-compliance with Noise Limits/Receipt of Complaint

If the guideline noise levels are exceeded during a survey as a result of construction works at the development or a complaint is received from a local resident, an investigation shall be instigated by the Site Manager as soon as possible consistent with safe operational practices and, as a minimum, within one working day to identify the cause of the non-compliance or complaint.

Such an investigation may involve the identification and cessation of the activity or activities considered to be the cause of the non-compliance/complaint (where operationally safe to do so) and/or the investigation of mitigation measures to reduce the noise emission levels from the activity or activities, for example the replacement of noisy plant with quieter alternatives and/or the use of temporary screens.

Any deviation from agreed working practices shall be identified immediately and conformance to the working practice reinstated.

A further noise survey shall be undertaken as soon as possible following the implementation of mitigation to re-assess the noise levels against the guideline noise levels.

A complaints response system shall be maintained for the site enabling any complaints regarding noise to be reported and appropriate action taken.

4.10 Data Retention

The noise survey data obtained during the routine noise surveys shall be retained for the full duration of the construction contract.

**Table 4-3
Demonstration of Construction BPM**

| Source Reference | Details of BPM actions/abatement in use | Actions/abatement to meet BPM | Timescale |
|--------------------------------|---|--|---|
| Access road construction plant | Working along access road route, partially screened at times – meets 55dBA criteria (as per the predictive impact assessment) | Use of localised screening where no natural screening present Careful routing of vehicles to ensure reversing is kept to a minimum | As/when required at approach and passing property |
| Site preparation works | Operations taking place behind natural screening where possible | Use of localised screening | As/when required |
| Foundation works | Excavator digging; Concrete truck and pumps | Use of localised screening | As/when required |
| Building works | Mobile crane lifting steel work; Concrete trucks and pumps; Hand operated tools – grinders, drills, etc. | Use of localised screening where possible | As/when required |
| Lorry Horns | Used as a Health and Safety measure to warn drivers and plant operators of potentially dangerous situations | None required | Not applicable |
| Lorry Movements | Where possible, haul routes to be routed behind natural screening mounds | All haul routes within the site boundary should be kept clean and free from potholes, ruts or bumps in order to avoid rattle and/or body slap. | As/when required |
| Generator | Generators installed in an acoustic enclosure | None required | In place |
| Compressor (if required) | Compressor installed in acoustic enclosure | None required | In place |
| General Site Operations | | | |
| All Operations | Noise monitoring scheme | Design and implement a noise monitoring scheme to show compliance with the guideline noise levels | See Section 5 |
| | Training | Site induction and site rules to include details of good working practices to minimise noise emissions from plant Information sheet for contractors outlining the requirement for good site practice and good neighbour practices | As soon as possible, not longer than 3 months. As soon as possible, in the interim contractors will be informed verbally |
| | Plant Maintenance | Plant will be maintained in a good state of repair at all times | On going |
| All Mobile Plant | Reverse warning systems | All mobile plant (owned and hired) are to be equipped with multi-frequency broadband reversing alarms | Prior to commencement |

5 PHASE 2, 3 & 4: OPERATIONAL NOISE MANAGEMENT PLAN

5.1 Operational Noise

The purpose of the operational noise monitoring scheme is to facilitate data acquisition to demonstrate to the local planning authority that the permitted development is being operated such that noise levels do not exceed the noise limits specified in Chapter 9 of the Environmental Statement.

In the event that the guideline noise limits are breached, the noise monitoring scheme will prompt remedial actions to ensure on-going future compliance.

5.2 Noise Sensitive Locations

For the purpose of monitoring operational noise emissions the residential properties listed in Table 5-1 would be used as receptor locations. Where possible, the noise monitoring locations selected will allow noise information that is representative of the identified location to be gathered without the necessity to access private land. Please refer to Figure 5.1.

Table 5-1 Operational Noise Receptors

| Receptor | Receptor Reference | Distance from Receptor to operations (m) | Agreed Daytime Operational Noise Limit (L_{Aeq} dB) Day-time (07.00 – 23.00) | Agreed Night-time Operational Noise Limit (L_{Aeq} dB) Night-time (23.00 – 07.00) |
|-----------------|--------------------|--|--|---|
| Gatewick Farm | NS1 | 751 | 55 | 45 |
| Gay Street Farm | NS2 | 1257 | 55 | 45 |
| Homefield Farm | NS3 | 720 | 55 | 45 |
| Woodbarn Farm | NS4 | 935 | 55 | 45 |

Table 5-2 outlines the predicted noise levels from on-site works, as defined in Chapter 9 of the Environmental Statement; all of which are lower than the agreed noise limit levels presented in Table 5-1.

Table 5-2 Phase 2 – Predicted noise levels from on-site works

| Noise Sensitive Premises | Phase 2a $dB L_{Aeq,T}$ | Phase 2b $dB L_{Aeq,T}$ |
|--------------------------|----------------------------|----------------------------|
| Gatewick Farm | 39 | 42 |
| Gay Street Farm | 35 | 38 |
| Homefield Farm | 40 | 42 |
| Woodbarn Farm | 36 | 39 |

Table 5-3 outlines the predicted ‘worst-case’ noise levels from on-site operations, as defined in Chapter 9 of the Environmental Statement. In this worst case it is possible that noise from site may contain identifiable characteristics such as tonal noise as defined in BS.4142:1997. The values in Table 5-3 assume this to be the case, and a 5dB penalty is therefore included. Note however that the application of the noise mitigation controls described in Appendix 1 should eliminate the need for a tonal

correction and the figures listed in Table 5-2 are the more likely to be realised. Without the penalty for tonal noise, all predicted noise rating levels are lower than the agreed night-time noise limit levels presented in Table 5-1. In accordance with the agreed assessment criteria outlined in Chapter 9 of the Environmental Statement, night time operations associated with Phase 2b will result in a predicted Negligible impact at all assessed receptors. This phase of operations will continue for 24 hours per day for a duration of 6 to 10 weeks.

Table 5-3 Phase 2 – Predicted ‘worst-case’ noise levels from on-site works

| Noise Sensitive Premises | Phase 2a Rating Impact Level <i>dB L_{Aeq,T}</i> | Phase 2b Rating Impact Level <i>dB L_{Aeq,T}</i> |
|--------------------------|---|---|
| Gatewick Farm | 44 | 47 |
| Gay Street Farm | 40 | 43 |
| Homefield Farm | 45 | 47 |
| Woodbarn Farm | 41 | 44 |

5.3 Responsibilities for Operational Noise Management

The implementation of the operational noise management scheme will be the responsibility of the Drilling Contractor's Site Manager (i.e. Senior Toolpusher) and performance will be monitored by the Celtique Energie Drilling Supervisor (on site) and Drilling Manager (off site).

5.3.1 Management Structure and Responsibilities

The main contractor's senior site manager (or his deputy) will be on site during working hours to be responsible for proper implementation of noise mitigation measures.

The key management roles with regard to the design and implementation of noise control at the construction site are the Project Manager (Celtique Energie) and Senior Site Manager. As outlined in Section 4.3, their roles will be defined in the site EMS and detailed duties include but are not limited to:

Project Manager: The Project Manager is responsible for implementation of the appropriate Environmental Policy and Sustainability Strategy through:

- compliance with contractual requirements regarding Environmental matters;
- approval of the PEP and control measures, and participation in regular reviews of the EMS to ensure its continued suitability and effectiveness;
- designate responsibility for environmental control during the works;
- regular meetings with project team members to review environmental matters;
- regular reporting to the Employer on environmental matters; and
- ensure adequate resources are made available.

Senior Site Manager: The Senior Site Manager is directly responsible to the Project Manager for the day to day administration of environmental issues. This shall include, but not be limited to:

- managing and advising on environmental matters affecting the Project;
- implementing the EMS on the project;

- reporting to the Project Manager on implementation of the PEP, good environmental practice and sustainability measures;
- carrying out regular internal audits and procedure review on environmental matters;
- review and updating of environmental system procedures and method statements;
- review and mitigate all environmental impacts of method statements;
- record and maintain all environmental matters/incidents in accordance with reporting procedures; and
- ensure all team members work in accordance with the PEP.

5.4 General Noise Control Measures

The mitigation measures outlined in Section 4.4 are also deemed appropriate for Phase 2, 3 and 4 operations. Although the operation of the drill rig does not constitute preparatory construction work, many of the generic control methods listed in Section 4.4 can be applied to minimise noise output from operations, such as applying silencers/enclosures to plant exhausts. Reference should be made to Table 3-3, which outlines the predicted receptor noise impact during Phases 2, 3 and 4.

Table 4-3 outlines the demonstration that BPM Techniques will be adopted to ensure that noise levels during operation of the development meet the relevant criteria. The table also includes any additional actions that could be used to help meet BPM.

5.5 Noise Monitoring Equipment

Environmental noise levels shall be measured using sound level meters conforming to type 1 or better of the latest versions of British Standard EN 61672-1:2003 *Electro-acoustics, Sound Level Meters, Specifications*.

The sound level meters shall be field-calibrated before and after monitoring using an acoustic calibrator conforming to the latest version of British Standard EN 60942:2003 *Electro-acoustics – Sound Calibrators*.

All sound level meters shall be calibrated to a traceable standard by a UKAS-accredited laboratory, or equivalent, within a 24-month period before the survey and all acoustic calibrators shall be calibrated to a traceable standard by a UKAS-accredited laboratory, or equivalent, within a 12 month period before the survey.

5.6 Noise Monitoring Methodology

Noise measurements shall be undertaken by a suitably qualified person at the noise sensitive locations identified in Table 5-1 and Figure 5-1. The noise measurements shall be undertaken during a normal working day and night, during typical working hours, avoiding meal breaks and times when plant and equipment within the site or on the access road are not operational.

Noise levels shall also be measured during a period when the site is not operational, for example during a lunch break or shift change, to enable a comparison to be made between the baseline and operational noise levels.

The sound level meter shall be positioned such that the microphone is located 1.5m above local ground level in free-field conditions, i.e. at least 3.5m from the nearest vertical, reflecting surface, at all survey locations.

Noise levels shall be measured over a one-hour period during the normal working day, or over an appropriate time period if in response to specific complaints or ad hoc requests.

Noise levels shall be measured over a fifteen-minute period during normal night-time operations, or over an appropriate time period if in response to specific complaints or ad hoc requests.

A note of the prevailing weather conditions shall be made at the time of the survey and the audibility of the site shall be noted at each measurement location during each measurement period.

5.7 Reporting

On completion of each noise survey a report shall be made available in a format suitable for submission to the local planning authority. Depending on the prevailing weather conditions, the report shall be submitted within five working days of the scheduled date for monitoring.

The report shall contain, as a minimum:

- the results of the noise survey, i.e. noise levels during site operations and noise levels with the site not operating, in terms of L_{Aeq} ;
- details of the instrumentation used including calibration details;
- details of the prevailing weather conditions on the day of the survey;
- details of the audibility of the site and comments regarding tonality and impulsive noise;
- details of any extraneous noise sources that influenced the noise climate; and
- details of any noise complaints received and actions taken to address the complaints.

5.8 Non-compliance with Noise Limits/Receipt of Complaint

If the guideline noise levels are exceeded during a survey as a result of operations at the development or a complaint is received from a local resident regarding the level or character (tonality) of the noise, an investigation shall be instigated by the Site Manager as soon as possible consistent with safe operational practices and, as a minimum, within one working day to identify the cause of the non-compliance or complaint.

If the breach is likely to continue then suitable mitigation measures shall be implemented, such as replacing faulty noise control equipment, substituting quieter replacement machinery, or the installation of additional noise reduction measures (see Appendix 1 - Section 5.2 of Permitting Documentation: Site Condition Report and Management & Monitoring Plan March 2014).

In the event that a serious breach is detected, the Environmental Health team at the Local Planning Authority shall be informed within 24 hours. A serious breach, for these purposes, is regarded as an equivalent continuous noise level $L_{Aeq,5min}$ above 45dB.

A further two-hour period of night-time noise monitoring shall be undertaken after the noise mitigation measures have been implemented, in order to demonstrate the success of the action(s).

Details of any action taken to reduce noise emissions shall be recorded, and the results of noise monitoring submitted to the Environmental Health team within two days of completion of the site visit.

A complaints response system shall be maintained by the Senior Site Manager for any complaints regarding noise to be reported and appropriate action taken (see Section 5.11 below).

5.9 Training

The site induction programme and site rules will include good working practice instructions for site staff, managers, visitors and contractors to help minimise noise whilst working on the site.

Good working practice guidelines/instructions will include, but not be limited to, the following points:

- Avoid unnecessary revving of engines;
- Plant used intermittently should be shut-down between operational periods;
- Avoid reversing wherever possible without comprising any site safety considerations;
- Drive carefully and within the site speed limit at all times;
- Report any defective equipment/plant as soon as possible so that corrective maintenance can be undertaken; and
- Handle material in a manner that minimises noise.

5.10 Maintenance

Maintenance of plant will be carried out routinely and in accordance with the manufacturers' guidance.

A weekly inspection of all plant and equipment will be undertaken as a minimum to ensure that:

- All plant is in a good state of repair and fully functional;
- any plant found to be requiring interim maintenance has been identified and taken out of use;
- acoustic enclosures fitted to plant are in a good state of repair;
- doors and covers remain closed during operation; and
- any repairs are being undertaken by a fully qualified maintenance engineer.

5.11 Communications

5.11.1 Contact Information

In accordance with BS5228 it is acknowledged that good relations with people living and working in the vicinity of site operations are of paramount importance. Good relations are developed by keeping people informed of progress and by treating complaints fairly and expeditiously. The Project Manager and Senior Site Manager are the appointed responsible persons to ensure this effective community liaison.

The contact details of the Project Manager and Senior Site Manager (including a 24 hour contact number) shall be displayed at the site entrance in order that complaints can be registered at all times.

In addition, the identified receptor properties (namely Gatewick Farm, Gay Street Farm, Homefield Farm and Woodbarn Farm) will be provided with the contact details direct.

The complaints response system identified at Section 5.8 will form part of the communications strategy.

6 ACTION PLANS

The noise monitoring schemes included in this report detail routine measurement surveys and the actions which will be taken following a non-compliance with the agreed noise levels and/or a complaint being received.

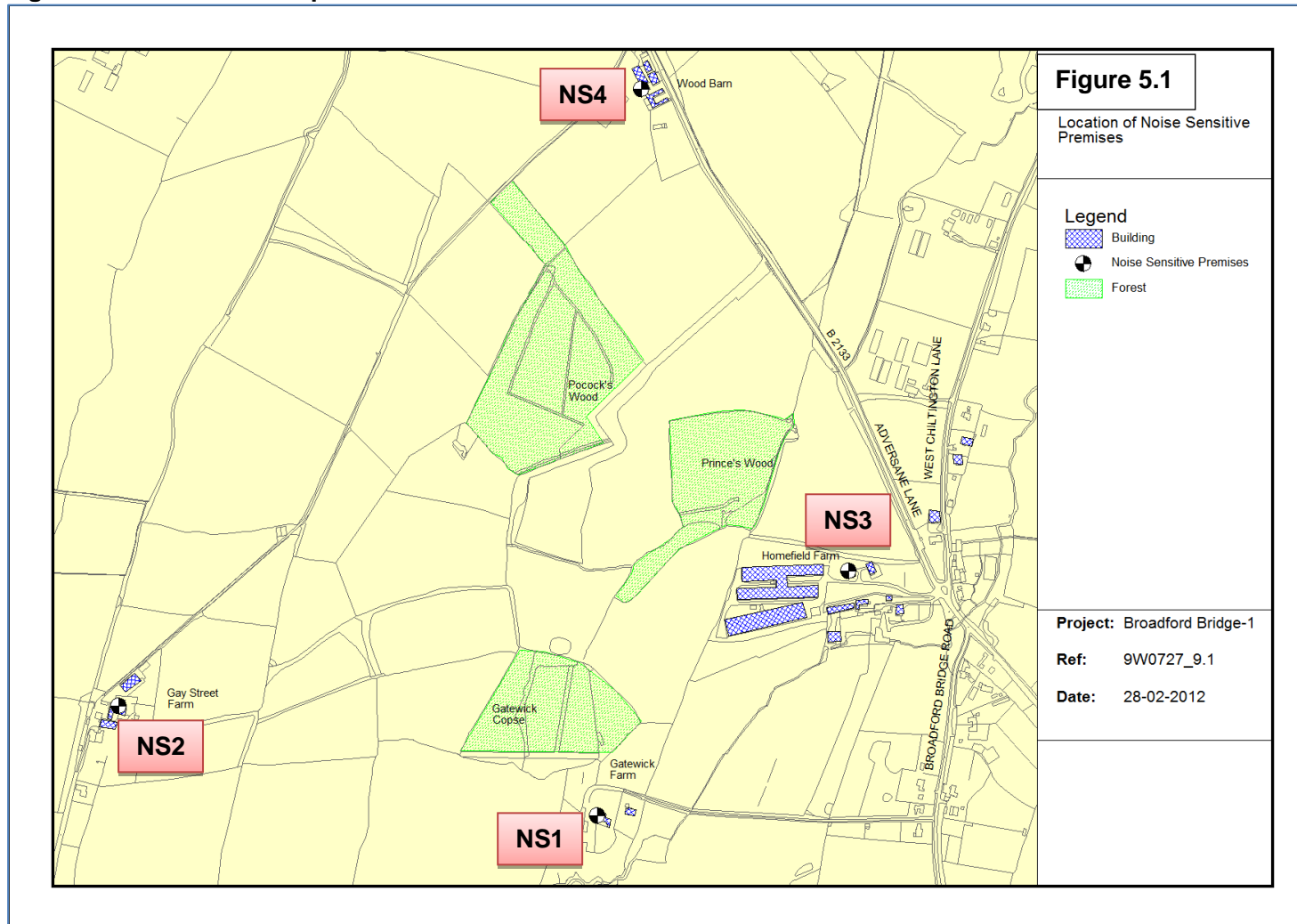
If the agreed noise levels are exceeded during a survey as a result of operations associated with the construction, operation or restoration of the development, an investigation shall be instigated within one working day to identify the cause of the non-compliance. Such an investigation may involve the identification and cessation of the activity or activities considered to be causing the non-compliance (where operationally safe to do so) and/or the investigation of additional mitigation measures to reduce noise levels from the activity or activities, for example the replacement of noisy plant with quieter alternatives and/or the use of temporary screens.

Any deviation from agreed working practices shall be identified immediately and conformance to the working practice reinstated.

A further noise survey shall be undertaken as soon as possible following the implementation of mitigation to re-assess the noise levels against the noise limits.

A complaints response system shall be maintained by the Drilling Manager during the construction, operational or restoration periods enabling complaints regarding noise to be reported and appropriate action taken.

Figure 5.1 Noise Receptor Locations





CELTIQUE ENERGIE

BROADFORD BRIDGE – 1

PERMITTING DOCUMENTATION

**SITE CONDITION REPORT AND
MANAGEMENT & MONITORING PLAN
FOR DRILLING**

| REVISION | DATE | PREPARED | CHECKED | APPROVED |
|-----------------|---------------|----------|---------|----------|
| 01 | 10/12/2013 | J Dobson | | P Bird |
| 02 | 21/01/2014 | J Dobson | | P Bird |
| 03 | 30/03/2013 | J Dobson | | P Bird |
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Table of Contents

| | |
|--|-----------|
| Table of Contents | 2 |
| 1 Introduction | 3 |
| 1.1 Background & Objectives | 3 |
| 1.2 Referenced Documentation | 3 |
| 1.3 Document Structure | 4 |
| 2 Drilling Operations Overview | 5 |
| 3 Site Condition Summary | 6 |
| 3.1 Summary of Regulated Facilities..... | 6 |
| 3.2 Baseline Information | 6 |
| <i>3.2.1 Environmental Statement (ES) Overview</i> | <i>6</i> |
| <i>3.2.2 Site & Surroundings - Overview</i> | <i>7</i> |
| <i>3.2.3 Geology - Overview.....</i> | <i>9</i> |
| <i>3.2.4 Hydrogeology - Overview.....</i> | <i>9</i> |
| <i>3.2.5 Hydrology / Flood Risk</i> | <i>13</i> |
| 5 Noise Monitoring | 15 |
| 5.1 Referenced Documentation | 15 |
| 5.2 Noise Mitigation Controls | 15 |
| 5.3 Measurement Locations and Noise Limits..... | 16 |
| 5.4 Noise Monitoring Scheme..... | 17 |
| 5.5 Non-Compliance with Noise Limits | 19 |
| 5.6 Data Retention | 19 |



1 Introduction

1.1 Background & Objectives

Celtique Energie Weald Limited (hereinafter referred to as “Celtique”) has prepared an Environmental Permit application to operate a Non-Inert Mining Waste Operations without a Mining Waste Facility.

This operation is for a conventional oil and gas exploration drilling. This prospecting activity will **NOT** involve hydraulic fracturing and there will be no injection of fluids into any formation.

Celtique is currently only applying for a Waste Management permit to drill the well. In the event that potentially economic hydrocarbon reserves are identified, a separate permit application or variation to this permit will be made to address the testing of the well.

This Site Condition Report and Management & Monitoring Plan presents:

- An assessment of the ‘Condition of Land at Permit Issue’ (as per the logic of Section 2.0 of the Site Condition Report template provided in Environment Agency Horizontal Guidance Note H5 - Site Condition Report (Guidance and templates) V3.0 April 2013);
- The Management and Monitoring arrangements that will be applied to verify that:
 - Control measures identified through the Waste Management Plan and its supporting Environmental Risk Assessment (document reference HSEC-BB-PD-04) are implemented and effective;
 - Environmentally-related conditions as listed in the Planning Permission for the operation are complied with;
 - Any environmental incidents are recorded and reported back through to Celtique’s management team

1.2 Referenced Documentation

This Site Condition Report and Management & Monitoring Plan is part of a suite of documentation submitted by Celtique as part of their permit applications. The full list of documents is as follows:

- Summary of Celtique’s HSE Management System (HSEC Management Standards, document number HSEC-MS-001);
- Environmental Method Statement (document number HSEC-BB-PD-01);
- Environmental Non-Technical Summary (document number HSEC-BB-PD-02);
- Site Waste Management Plan (document number HSEC-BB-PD-04);
- “Green lined” Site Plan (document number HSEC-BB-PD-05).

In addition, with particular reference to the description of the Site Condition, reference is made to the detailed site condition assessments presented in the Broadford Bridge Environmental Statement (which has been approved by West Sussex County Council) and which the Environment Agency (EA) has previously reviewed as one of the statutory consultees.

This document has been written to be as self-contained as possible resulting in some repetition of the information contained in these referenced documents, particularly with regard to the:

- Environmental Method Statement (HSEC-BB-PD-01);
- Information contained in the Environmental Statement. In this regard Appendix 1 to this document contains the whole GroundSure report (EnviroInsight & GeoInsight) which was submitted as part of the Environmental Statement.

1.3 Document Structure

The document is structured as follows:

- **Section 2** provides a very **high level overview of the planned drilling operations** (for more information the reader is referenced to “Environmental Method Statement – document number HSEC-BB-PD-01);
- **Section 3** provides information on the current **Site Condition** (for more information the reader is referenced to Broadford Bridge Environmental Statement);
- **Section 4** addresses the **Surface Water Monitoring Plan** which will be implemented prior to, during and after drilling operations;
- **Section 5** addresses the **Noise Monitoring Plan** which will be implemented during construction and drilling operations.



2 Drilling Operations Overview

A summary of the drilling operations is provided in the “Non-Technical Summary” – document number HSEC-BB-PD-02. A more detailed description is provided in the “Environmental Method Statement” – document number HSEC-BB-PD-01. These documents should be referenced to provide more information on the drilling operations but, in summary:

- Celtique has been given permission by the West Sussex County Council Planning Authority for a temporary borehole to explore, test and evaluate hydrocarbons (specifically gas) at the Broadford Bridge -1 site in the Weald basin, West Sussex (Application WSCC/052/12/WC dated 13th February 2013);
- The planned operations do not include hydraulic fracturing;
- The plan is to drill an essentially vertical pilot hole (the well is drilled at a slight angle to the vertical (of around 20°);
- The drilling operation from ‘spud’ to installation of the completion is estimated to take around 60 days;
- Aquifers will be drilled through with (non-hazardous) water based drilling fluids (water based “muds” - WBM), deeper formations with low toxicity oil based drilling fluid (oil based “muds” – OBM);
- The drilling operation will be conducted in full compliance with all UK safety and environmental regulations including the Mining Waste Directive and its implementing Regulations, the Environmental Permitting (England & Wales) Regulations 2010, as amended.

3 Site Condition Summary

3.1 Summary of Regulated Facilities

The operation is located on land at Woodbarn Farm, between Pocock's Wood and Prince's Wood, some 500m west of the hamlet of Broadford Bridge, and nearly 3 kms south of Billingshurst (Ordnance Survey Grid Reference TQ 09057 21771 / Easting 509017 Northing 121741 / Latitude 50° 59' 3.1" North 0° 26' 47.7" West). Its postal address is:

Wood Barn Farm
Adversane Lane
Broadford Bridge
Billingshurst
West Sussex.

This document covers the construction of a drilling pad and the drilling of a borehole at this site.

This section is a summary of the detailed site condition assessments presented in the Broadford Bridge Environmental Statement (which has been approved by West Sussex County Council) and which the Environment Agency (EA) has previously reviewed as one of the statutory consultees. Further detail is provided in Appendix 1 and in the Broadford Bridge Environmental Statement itself.

3.2 Baseline Information

3.2.1 Environmental Statement (ES) Overview

The Broadford Bridge Environmental Statement (ES) details the study work (including field assessments) carried out to define the existing environmental baseline and potential impacts from the operation with particular regard to:

- Ecology;
- Landscape / Visual impact;
- Noise;
- Ground and Groundwater Protection.

The reader is referred to this ES for a full description of the existing site conditions, however the studies described in the Environmental Statement summarise the environmental baseline as follows:

- All of this area is represented by farmland which has no history of contaminative use;
- There are no licensed surface water abstractions within 1km of the drill site;
- Reference to the Natural England website indicates that there are no protected sites within influential distance of the drill site, the closest being >10km distant;
- Reference to the EnviroInsight section of the Groundsure Report, commissioned by Celtique Energie as part of the ES confirms that there are no environmentally sensitive sites within 500m of the drill site boundary. This document is included as Appendix 1.

Given the distances to these sites from the drill site area, and the reliance of the sites on factors that are unaffected by the drilling operation, no adverse impact on these protected sites is anticipated.

The assessment of environmental impacts contained in the Environmental Statement have been further refined by a separate Environmental Risk Assessment (ERA – Appendix 1 of document number HSEC-BB-PD-04) which concludes that, with the implementation of the arrangements and mitigating measures referenced in the ERA, the environmental risk posed by the borehole is negligible.

HSEC-BB-PD-03 Site Condition, Management and Monitoring_Drilling

The ES concluded that, with the mitigation measures agreed as part of the Planning Approval, the environmental impacts of the operation were acceptable. However, because of the relative importance of surface water and noise impacts, a decision has been taken to monitor both surface water and noise during the operation to demonstrate the effectiveness of mitigation measures. The respective monitoring programmes are described in section 4 (surface water) and section 5 (noise); they will assess environmental performance against the ES baseline.

3.2.2 Site & Surroundings - Overview

The Broadford Bridge -1 site is shown in Figure 3.1. It lies in the County of West Sussex and the District of Horsham, approximately 7km to the south east of Horsham and 3km to the south of Billingshurst, within the Parish of West Chiltington. At present, it consists of Grade 3 agricultural land which forms part of a larger field in pastoral use. With the exception of the field's northern boundary, the site is enclosed from the surrounding countryside by existing woodland blocks. The most significant areas of woodland consist of Pocock's Wood to the north west and Prince's Wood approximately 150m to the east, the latter of which is designated as Ancient Woodland.

Access to the site is obtained via an existing agricultural track which passes north along the eastern extent of Pocock's Wood before diverting north east towards the main farm yard associated with Wood Barn Farm and joining the B2133. An alternative access point off the B2133, lies approximately 340m to the north east of the site and 280m to the south of Wood Barn Farm.

The local area forms part of the Low Weald and lies approximately 5.5km east of the South Downs National Park. The area is generally characterised by gently undulating farmland enclosed by mature hedgerows and scattered woodland blocks. The settlement pattern of the Low Weald comprises a network of farmsteads and associated agricultural workings alongside smaller villages, groups of residential properties and individual cottages and homes. There are a number of Listed Buildings in the vicinity of the site including Broadford Bridge Farmhouse 500m to the south east, and Brook House Farmhouse 600m east, both of which are Grade II Listed. The Listed Buildings in the vicinity of the site can be seen on Figure 3.2. There is an area approximately 950m west of the site which is identified as being an "Archaeological Site" in Horsham District Council's adopted Core Strategy (2007), and is also adjacent to areas of Ancient Woodland - Beedings Copse. However, there are no Scheduled Monuments within the vicinity of the site.

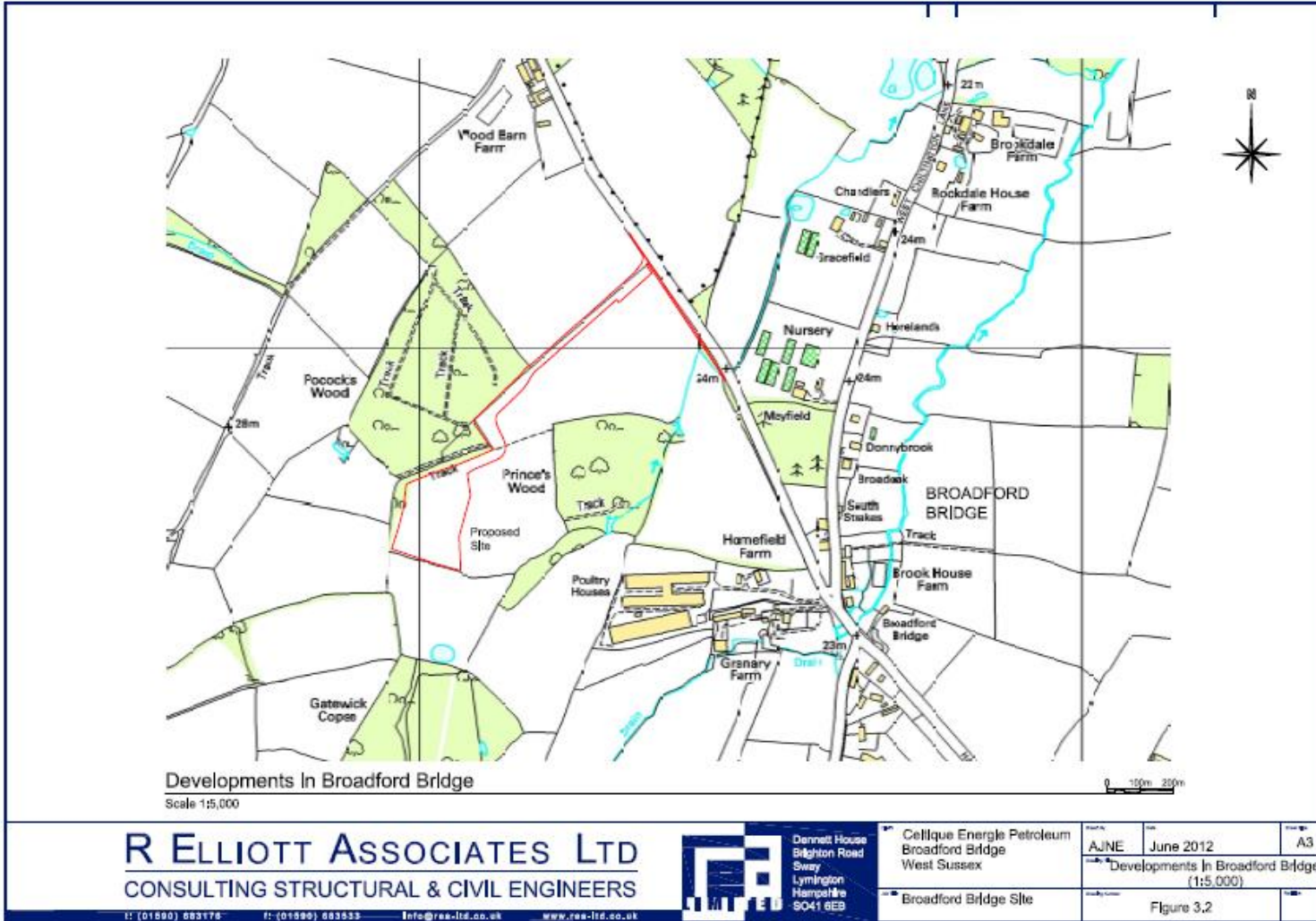
The site forms part of a working farm with the closest area of development being approximately 300m to the south east, consisting of a number of poultry houses at Homefield Farm. The main farmhouse lies 500m to the south east along with other detached properties associated with the hamlet of Broadford Bridge. With the exception of Broadford Bridge to the east, and Adversane to the north west, the most significant area of development is the village of Billingshurst which lies approximately 3km to the north of the site. There are a number of roads through the area including the A29 Stane Street, A272 West Chiltington Lane and B2133 Adversane Lane as well as numerous small farm roads and tracks. The Pulborough to Parbrook railway line is located just under 2km to the west of the site with the A29 Stane Street running in parallel, a further 250m west from the railway line.

In addition to the areas of woodland immediately surrounding the site, there are a number of large areas of Ancient Woodland within the locality including, Steepwood Copse 1.3km north west of the Application Site, and Marringdean Wood a further 450m north west. Notwithstanding the areas of Ancient Woodland, there is also extensive non-ancient woodland and tree coverage throughout the local vicinity.

The River Adur runs in the vicinity of Broadford Bridge and a north-east flowing tributary brook of the Adur is located on lower ground some 400m south east of the site, and flows through Broadford Bridge. In addition there is a small pond 250m east of the site, located in Prince's Wood with a drainage outflow to the north that connects with another tributary of the River Adur. Another small pond is located 200m north west of the site, on the south western edge of Pocock's Wood, with a further pond located 320m south of the site in Gatewick Copse.



Figure 3.1: Site Location Plan



3.2.3 Geology - Overview

The site is located on the southern side of the Weald Basin. Relevant geological information is provided in the Groundsure Geolnsight section of the Groundsure report presented at Appendix 1.

In summary, it is an area where Lower Cretaceous Wealden Beds dip southwards towards the South Downs where they become overlain by younger Lower Greensand and Chalk sequences. There are no superficial deposits in the vicinity of the Application Site, the closest ones being the tracts of alluvium and Head Deposits approximately 3km east of the drill site. The Wealden Beds are underlain by a progressively older sequence of Mesozoic and Palaeozoic strata.

3.2.4 Hydrogeology - Overview

a) The Aquifer System

The stratigraphy and lithology summarised in section 3.2.3 results in the aquifer system presented in Table 3.1 below. The Aquifer Designation accords with the latest Environment Agency Groundwater Protection Policy (GP3). The geological structure is such that the proposed exploratory borehole:

- Will not penetrate any of the Secondary Aquifers formed by the superficial deposits to the east;
- Will not encounter the Upper Tunbridge Wells Sand until a drilled depth of approximately 160m has been reached;
- May penetrate the Secondary Aquifers formed by the sandstone and limestone lenses within the Weald Clay but down-dip or cross-strike of any water supply boreholes that penetrate them.

Map 5b of the EnviroInsight section of the Groundsure Report at Appendix 1 shows the distribution of aquifers within 500mm of the Application Site. The only ones present are the Secondary A aquifers associated with sandstones in the Weald Clay Formation, some of which are clearly discontinuous. The remaining area is classified as "Unproductive Strata".

b) Groundwater Levels and Flow

There are no data on groundwater levels and flow in the area. However it may be inferred that:

- The Weald Clay materials directly beneath the drill site are likely to be characterised by a low overall permeability with little deep infiltration of rainfall and shallow down-slope interflow only;
- Groundwater in the superficial deposits and in the Secondary Aquifer sandstones and in the Weald Clay:
 - is locally recharged and unconfined at outcrop with subsequent down -dip flow into a confined zone;
 - is characterised by a low overall throughput of water;
- Groundwater in the deeper Secondary Aquifers, starting with the Upper Tunbridge Wells Sand:
 - will be recharged on the outcrop area, which is some 10km to the north east and beyond;
 - will flow southwards according to the regional dip of the strata;
 - has no practical connection with groundwater beneath the site or through which the proposed hydrocarbon exploratory borehole will penetrate.

Regarding the southerly groundwater flow in the deeper Secondary Aquifers, the actual depth of the aquifers beneath the drill site may be such that there is little actual groundwater movement in that area. Hydrochemical processes may then be such that the groundwater is of poor quality.



Table 3.1: The Aquifer System

| Stratigraphic Unit | Aquifer Designation | Inferred or Recorded Aquifer Characteristics |
|-----------------------------|---|---|
| Weald Clay Formation | Mostly unproductive strata but includes minor sandstones and limestone which are given Secondary A status (formerly designated a minor aquifer of low vulnerability) | Sandstone inferred to have moderate primary and secondary porosity and permeability with resource value constrained by limited lateral extent. |
| Upper Tunbridge Wells Sand | Secondary A | Recorded as sandstone and siltstone. Presumed in parts to have moderate to high primary and secondary porosity and permeability. |
| Grinstead Clay | Unproductive strata | |
| Lower Tunbridge Wells Sands | Secondary A | Recorded as sandstone and siltstone. Presumed in parts to have moderate to high primary and secondary porosity and permeability. |
| Wadhurst Clay | Mostly unproductive strata but includes minor sandstones and limestone which are given Secondary A status. | Sandstone inferred to have moderate primary and secondary porosity and permeability with resource value constrained by limited lateral extent. |
| Ashdown Beds | Sands and sandstone layers are given Secondary A status. | Sandstone inferred to have moderate primary and secondary porosity and permeability with resource value constrained by limited lateral extent. |
| Purbeck Beds | Formations below this depth (i.e. > 400m begl) are generally not recognised as aquifers in this region, being too deep to exploit and likely to contain poor quality groundwater. | Mostly low permeability argillaceous formations not used as aquifers. |
| Purbeck Anhydrite | | |
| Portland Sandstone | | |
| Kimmeridge Clay | | |
| Corallian Beds | | |
| Oxford Clay | | |
| Kellaways Beds | | |
| Cornbrash | | |
| Great Oolite | | A Principal Aquifer outside of this region, whose aquifer properties are mainly dependent on extensive secondary porosity and permeability which is unlikely to be extensively developed at the depth at which it occurs below the Broadford Bridge area (> 1500m depth). |
| FullersEarth | | Mostly low permeability argillaceous formations not used as aquifers. |
| Inferior Oolite | | |
| Upper Lias | | |
| Middle Lias | | |
| Lower Lias | | |
| Triassic | | Includes the Sherwood Sandstone, which is a Principal Aquifer outside of this region. Unlikely to contain freshwater at this depth (>1500m) and thought to be hydrocarbon-bearing. |
| Palaeozoic | | Too deep to be of significance |

c) Groundwater Utilisation

The EnviroInsight section of the Groundsure Report included at Appendix 1 includes a record of licensed groundwater and surface water abstractions in an area up to 1000m away from the drill site. There are no licensed groundwater abstractions in this area, nor are there any Source Protection Zones, the closest being those associated with the Lower Greensand formations to the south, which are not penetrated by the proposed borehole.

HSEC-BB-PD-03 Site Condition, Management and Monitoring_Drilling

Figure 5 of the GeoInsight Report of Appendix 1 shows the location of a series of water wells in the area as recorded by BGS. None would be expected to be hydraulically connected to the proposed exploratory borehole, being either up-gradient, in different groundwater catchments, or in aquifers not penetrated by the proposed borehole.

d) Groundwater Vulnerability

The Groundwater Vulnerability Map for the area (Sheet 45, West Sussex and Surrey) indicates the Secondary Aquifers referred to above (termed Minor Aquifers on the map) to be characterised by low vulnerability, which means that they are relatively resistant to pollution occurring at the surface.

e) Likely Significant Effects

Potential effects are assessed below and all are identified as having only minor significance. In addition, mitigation measures to further reduce risk and / or impact are identified and will be implemented.

1. **Construction of the Access Road and Well Site:**

- i. **Soil Moisture Conditions in Prince's Wood:** Specifically in respect of the ancient woodland known as Prince's Wood, there is a potentially adverse effect on soil moisture due to interception of runoff and/or interflow from upstream, mainly as a result of construction of the access road. Whilst the access road is upstream of the wood in terms of groundwater flow, due to the low permeability soil conditions, this is a very small component of the water balance and no adverse effects would be expected. Soil moisture in the woodland is most likely to be controlled primarily by rainfall falling on it balanced by losses due to evapotranspiration. On that basis, the anticipated Scale of the Effect is Low, the Magnitude of the effect is also Low, and in the context of Phase 1 only the effect is short-term. The overall significance is therefore Minor. However, to further reduce risk the access track will be constructed so as to allow down-slope run off and shallow groundwater flow to occur. In addition, to assure the effectiveness of these mitigation measures, a surface water monitoring plan will be implemented (see section 4).

2. **Mobilisation of the Drill Rig and Drilling Operations**

- i. **Soil Moisture Conditions in Prince's Wood:** The level of significance of this effect will continue to be negligible as discussed in 1(i) above
- ii. **Land Contamination at the Drill Site and Release of Contaminated Runoff:** This is a potentially adverse effect involving uncontrolled surface release (i.e. spillages) of contaminative substances used in connection with the drilling works (chemical additives, lubricants etc.), however caused. This process potentially leads to ground contamination, groundwater contamination, and surface water contamination following the off-site migration of run-off from rainfall. The effect would be direct, short term, but local only, and therefore the Scale of the Effect is Low. The potential magnitude of the effect is considered to be medium because of downstream water pollution impacts and the overall significance is therefore moderate/minor.

This risk is mitigated through site design and operation. These are described in detail in the Environmental Method Statement (HSEC-BB-PD-01) but in summary.

- ❑ As part of site preparation, all parts of it will be underlain by an impermeable, puncture resistant geotextile membrane placed on compacted and levelled foundation material. The drilling muds and cutting skips will be located within this impermeable membrane area;
- ❑ Visual monitoring of site surface will be undertaken daily by the Site HSE Advisor to make sure that the impermeable membrane is not exposed or damaged and that there are no holes or ripping of the membrane which would allow leakage. Any repairs will be undertaken immediately and records kept in the site maintenance record;
- ❑ In addition, all drilling fluid additives will be stored in a designated bunded area. These arrangements restrict the likelihood of spillages and leaks

HSEC-BB-PD-03 Site Condition, Management and Monitoring_Drilling

occurring prevent them contaminating the natural ground present beneath the drill site;

- ❑ The site boundaries comprise a ditch system. All ditches and the drill cellar are pumped out and the water tankered off site to a water treatment plant;
- ❑ Diesel fuel for the rig generator is stored in compliance with the Control of Pollution (Oil Storage) Regulations 2001 in a double skinned container. The oil storage containers shall be correctly labelled (contents, toxicity and capacity). Inspection of the diesel storage container shall form part of the daily HSE inspection tour. Refuelling activities from the delivery tanker to the main diesel container shall be a supervised operation to prevent overfilling, poor connections and to respond to leaks in a timely manner. To prevent a pathway for diesel spills or leaks, secondary containment shall be located underneath connections and pipes, to capture drips or leaks. The site layout is constructed to minimise the length of refuelling pipe from the tanker to the diesel storage tank. Spilled diesel and/or diesel contaminated materials will be collected and stored in sealed containers and transported to an authorised treatment/recovery facility;
- ❑ There will be a wide range of lubricants, greases and hydraulic fluids stored on site. All containers will be clearly labelled to identify contents, toxicity and capacity. Daily inspections are required by the site HSE Advisor to ensure any tanks used are not being overfilled. Waste materials or contaminated absorbents will be collected and stored in sealed containers and transported to an authorised treatment/recovery facility;
- ❑ Paper and cardboard will be recycled. Canteen and kitchen wastes will involve putrescible materials (food waste) and will need their own separate bin. These wastes will be collected by a private waste collection company and will most likely be sent for disposal. No waste will be buried or burnt onsite;
- ❑ All dirty water and washdown water from cleaning operations on the rig will be collected and stored in on-site sealed tanks, with secondary containment to ensure there is no escape of material to the local watercourses and groundwater. Material will be tankered offsite to an approved treatment/recovery plant. Records will be kept of amounts and details kept of any offsite shipments;
- ❑ Sewage resulting from personnel operating the site will be collected separately and not mixed with any of the dirty/washdown water. A waste contractor will regularly collect any sewage (vacuum tanker) and transport it to an EA approved offsite treatment plant;
- ❑ In addition, to assure the effectiveness of these mitigation measures, a surface water monitoring plan will be implemented (see section 4).

- iii. **Contamination of Aquifers during Drilling:** This is a potentially adverse effect caused by the release of drilling fluids into aquifers during drilling and their onward migration to water wells and surface waters. In respect of the sandstones in the Wealden Beds that are locally exploited there is an inherently low likelihood of this process occurring to any extent because they are thin, frequently discontinuous and of relatively low permeability. The effect is direct and short to medium term because of the slow sub-surface migration of contaminants. Hydrogeological conditions are such that the anticipated Scale of the Effect is Low and the magnitude of the effect is also Low. The overall significance is therefore minor.

This risk is mitigated through site design and operation. These are described in detail in the Environmental Method Statement (HSEC-BB-PD-01) and their effectiveness is assessed in the ERA (Appendix 1 of HSEC-BB-PD-04) but, in summary, the key mitigation controls are:

- ❑ Use of a water-based drilling mud with non-toxic additives;

HSEC-BB-PD-03 Site Condition, Management and Monitoring_Drilling

- Control of the mud-balance such that lost circulation and invasion of the formations penetrated is minimal;
 - The very short-term exposure of the formation to the drilling mud, given that the hole is quickly cased after drilling.
- iv. **Consequential Effects on Protected Areas:** The lack of any protected areas within 10km of the site is such that this potentially adverse effect is not significant and may be classified as negligible.
- v. **Accidental Release of Contaminants into the Borehole during Drilling:** This is a potentially adverse effect similar to item 2(iii) above caused by the spillage and release of chemicals (in storage at the site) into the borehole and thus potentially into an aquifer during drilling, and their onward migration to water wells and surface waters. The effect is direct and short to medium term because of the slow sub-surface migration of contaminants. Again, hydrogeological conditions are such that the anticipated Scale of the Effect is Low and the magnitude of the effect is also Low. The overall significance is therefore minor.

The risk is mitigated as described in 2(iii) above. In addition, the impermeable geotextile liner is sealed around the well cellar, preventing entry of spilled contaminants into the borehole

3.2.5 Hydrology / Flood Risk

A review of the Environment Agency Flood Zone map has identified that the site is located within Flood Zone 1, which is classified as 'Low Probability' and defined as: "This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%)".

As part of the planning process, discussions were held with the EA (Grant Moffatt, Development and Flood Risk Officer, Environment Agency) during February 2012 and the EA concluded that "In view of the short time that [Celtique]... plan to be on site I have no concerns in respect to your surface water proposals".

4 Surface Water Monitoring

A site survey and inspection is detailed in section 3 of the Environmental Statement. In summary:

- The River Adur runs in the vicinity of Broadford Bridge-1 and a north-east flowing tributary brook of the Adur is located on lower ground some 400m south east of the Drilling Site, and flows through Broadford Bridge;
- There is a small pond 250m east of the Site, located in Prince's Wood with a drainage outflow to the north that connects with another tributary of the River Adur;
- Another small pond is located 200m north west of the Site, on the south western edge of Pocock's Wood, with a further pond located 320m south of the Site in Gatewick Copse.

The mitigation measures as discussed in section 3.2 above will prevent impacts to the above receptors. However, to assure the continuing effectiveness of these measures and following Environmental Agency review and approval, Celltique will implement the Monitoring Scheme summarised below:

- Samples will be taken from the locations listed above to establish baseline conditions prior to initiation of any construction and / or drilling work;
- Samples will continue to be taken from the locations listed above to identify any departures from the baseline during and after the construction and / or drilling works;
- The results of all sampling will be benchmarked against Environment Quality Standards;
- Precise sampling locations will be identified based on field inspection to confirm proximity to the site, access issues, the direction of stream flow, and the down-gradient direction of potential runoff from the site;
- Type 1 (field testing) and Type 2 (laboratory analyses) of the samples will take place as defined below:
 - Type 1: On-site instrument-measured Temperature, Dissolved Oxygen, Electrical Conductivity, pH, Redox Potential, and Turbidity.
 - Type 2: Sample recovery and laboratory chemical analysis for: Ammoniacal Nitrogen, Arsenic, Barium, Boron, Cadmium, Calcium, Chloride, Total Chromium, Copper, Lead, Magnesium, Mercury, Nickel, Potassium, Selenium, Sodium, Zinc, pH, PAH, EPH, GRO (BTEX), COD, TDS, Electrical Conductivity, and Alkalinity
- The proposed sampling frequency of the monitoring programme is shown in Table 4.1 below.

Table 4.1: Sampling Frequency

| Month | Activity | Type1 | Frequency | Type 2 | Frequency | Daily Inspection * |
|-------|--------------------|-------|--|--------|---------------------|--------------------|
| 1 | Pre-Mobilisation | YES | One sample, week 1 | YES | One sample, week 1 | |
| 2 | Site Establishment | YES | Samples weeks 5 & 9 | YES | One sample, week 9 | |
| 3 | Drilling | YES | Weekly on-site testing during drilling | YES | One sample, week 10 | YES |
| 4 | Drilling | YES | | YES | One sample, week 15 | YES |
| 5 | Demobilisation | YES | One sample, week 19 | YES | One sample, week 19 | |
| 6 | None | YES | One sample, week 23 | YES | One sample, week 23 | |

Note:

* By site HSE Advisor to identify any changes in water quality (if flowing) at sample points.

5 Noise Monitoring

The Environmental Statement, voluntarily submitted by Celtique Energie as part of the Planning Approval process identifies noise limits for the site and its surroundings.

As requested by the conditions of the Planning Approval from West Sussex County Council Authority (Planning Condition 08 of WSCC/052/12/WC planning approval) the development shall not commence until a Noise Management Plan has been prepared, submitted to the County Planning Authority for approval and implemented. The plan (which has been submitted) details the monitoring of the site throughout all phases of development, including night-time working and identifies the further mitigation actions which will be taken should such noise monitoring establish that the limits (as specified in the Environmental Statement) are being exceeded. These further actions will include the documentation of details for further mitigation and a timetable for implementation which will be submitted to the County Planning Authority for approval and then implemented.

The West Sussex County Council Authority have primacy in approving this plan but, in the light of its importance, a summary of the submitted plan is included in this section 5 for information.

5.1 Referenced Documentation

In order to define the “standard day time construction and operational and night time decibel levels”, the following guidance is referenced:

- **British Standard (BS) 7445: Parts 1 and 2 - Description and measurement of environmental noise.** The Standard provides details of the instrumentation and measurement techniques to be used when assessing environmental noise, and defines the basic noise quantity as the continuous A-weighted sound pressure level (LAeq). Part 2 of BS 7445 replicates ISO standard 1996-2;
- **British Standard (BS) 5228: Code of practice for noise and vibration control on construction and open sites - Part 1.** This document provides recommendations for basic methods of noise and vibration control relating to construction and open sites where work activities/operations generate significant noise and/or vibration levels. The legislative background to noise and vibration control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. This British Standard provides guidance on methods of predicting and measuring noise and assessing its impact on those exposed to it;
- **World Health Organisation (WHO) Guidelines for community noise.** These guidelines present health-based noise limits intended to protect the population from exposure to excess noise. It presents guideline limit values at which the likelihood of particular effects, such as sleep disturbance or annoyance, may increase. The guideline values are 50 or 55dB LAeq during the day, related to annoyance, and 45 dB LAeq or 60dB LAm_{ax} at night, related to sleep disturbance.

5.2 Noise Mitigation Controls

Celtique Energie operates a HSEMS consistent with the logic of ISO 14001 and will ensure that the HSE arrangements of all its main contractors are compliant with this approach. In addition, it will require them to report against the Considerate Constructors Scheme Code of Considerate Practice, designed to encourage best practice beyond statutory requirements.

Celtique will require that its main contractor maintains a site presence during working hours to ensure the robust implementation of noise management and mitigation measures. The Control of Pollution Act and British Standard 5228 define a set of Best Practice working methods and mitigation measures, referred to as Best Practicable Means (BPM) and these will be followed. Examples of these measures which will be applied as appropriate during construction and drilling operations include some or all of the following:

- Where possible, locating plant so that it is screened from receptors by on-site structures, such as site cabins;

HSEC-BB-PD-03 Site Condition, Management and Monitoring_Drilling

- Using mobile screening to shield receptors from particularly noise equipment/activities;
- Using 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;
- Implementing a site induction programme and site rules which include good working practice instructions for site staff, managers, visitors and contractors to help minimise noise whilst working on the site. these good working practice guidelines/instructions will include, but not be limited to, the following points:
 - Avoid unnecessary revving of engines;
 - Plant used intermittently should be shut-down between operational periods;
 - Avoid reversing wherever possible without comprising any site safety considerations;
 - Drive carefully and within the site speed limit at all times;
 - Report any defective equipment/plant as soon as possible so that corrective maintenance can be undertaken;
 - Handle material in a manner that minimises noise.
- Maintenance of plant will be carried out routinely and in accordance with the manufacturers' guidance. A weekly inspection of all plant and equipment will be undertaken as a minimum to ensure that:
 - All plant is in a good state of repair and fully functional;
 - Any plant found to be requiring interim maintenance has been identified and taken out of use;
 - Acoustic enclosures fitted to plant are in a good state of repair;
 - Doors and covers remain closed during operation;
 - Any repairs are being undertaken by a fully qualified maintenance engineer.

Effective communication with the local population regarding noise issues will be maintained through:

- Keeping local residents informed of the type and timing of works and any particularly noisy operations expected or out of hours working;
- Providing 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. These contact details shall be displayed at the site entrance in order that complaints can be registered.

5.3 Measurement Locations and Noise Limits

The general area of the residential properties listed in Table 5-1 will be used as receptor locations. (Where possible, the noise monitoring locations selected will allow noise information that is representative of the identified location to be gathered without the necessity to access private land). Figure 5.1 shows the location of these properties in relation to the borehole.

The maximum noise limits agreed with the West Sussex County Council Authority as part of the planning approval are listed in Table 5.1. The potential noise from the planned construction and drilling works has been calculated in the Environmental Statement and shown to be below these limits. Nevertheless, the mitigation controls listed in section 5.2 above will be implemented.

Table 5-1: Operational Noise Receptors

| Receptor | Receptor Reference | Distance from Receptor to operations (m) | Agreed Noise Limits (LAeq dB) | | |
|-----------------|--------------------|--|---|----------------------------------|--------------------|
| | | | Daytime & Saturday Morning ¹ | Evenings & Weekends ² | Night ³ |
| Gatewick Farm | NS1 | 751 – south west | 55 | 55 | 45 |
| Gay Street Farm | NS2 | 1257 - west | 55 | 55 | 45 |
| Homefield Farm | NS3 | 720 - east | 55 | 55 | 45 |
| Woodbarn Farm | NS4 | 935 - north | 55 | 55 | 45 |

Notes:

1. 07.00 to 19.00 weekdays and 07.00 to 13.00 Saturdays
2. 19.00 to 23.00 weekday, 13.00 to 23.00 Saturdays and 07.00 to 23.00 Sundays
3. 23.00 to 07.00

5.4 Noise Monitoring Scheme

To provide assurance that the above controls are successful in mitigating noise levels during construction and drilling operations within the guideline noise limits set out in BS5228-1:2009 (and as listed in Table 5.1) and in such a manner as to minimise the noise impacts at nearby noise-sensitive receptors, the following monitoring plan will be implemented. It is the responsibility of the Celtique Drilling Manager to ensure effective implementation and operation of the plan.

Environmental noise levels shall be measured using sound level meters conforming to Type 1 or better of the latest versions of British Standard EN 61672-1:2003 *Electro-acoustics, Sound Level Meters, Specifications*. The sound level meters shall be field calibrated before and after monitoring using an acoustic calibrator conforming to the latest version of British Standard EN 60942:2003 *Electro-acoustics – Sound Calibrators*. All sound level meters shall be calibrated to a traceable standard by a UKAS-accredited laboratory, or equivalent, within a 24 month period before the survey and all acoustic calibrators shall be calibrated to a traceable standard by a UKAS-accredited laboratory, or equivalent, within a 12 month period before the survey.

The sound level meter shall be positioned such that the microphone is located 1.5m above local ground level in free-field conditions, i.e. at least 3.5m from the nearest vertical, reflecting surface, at all survey locations. A note of the prevailing weather conditions shall be made at the time of the survey and the audibility of the site shall be noted at each measurement location during each measurement period.

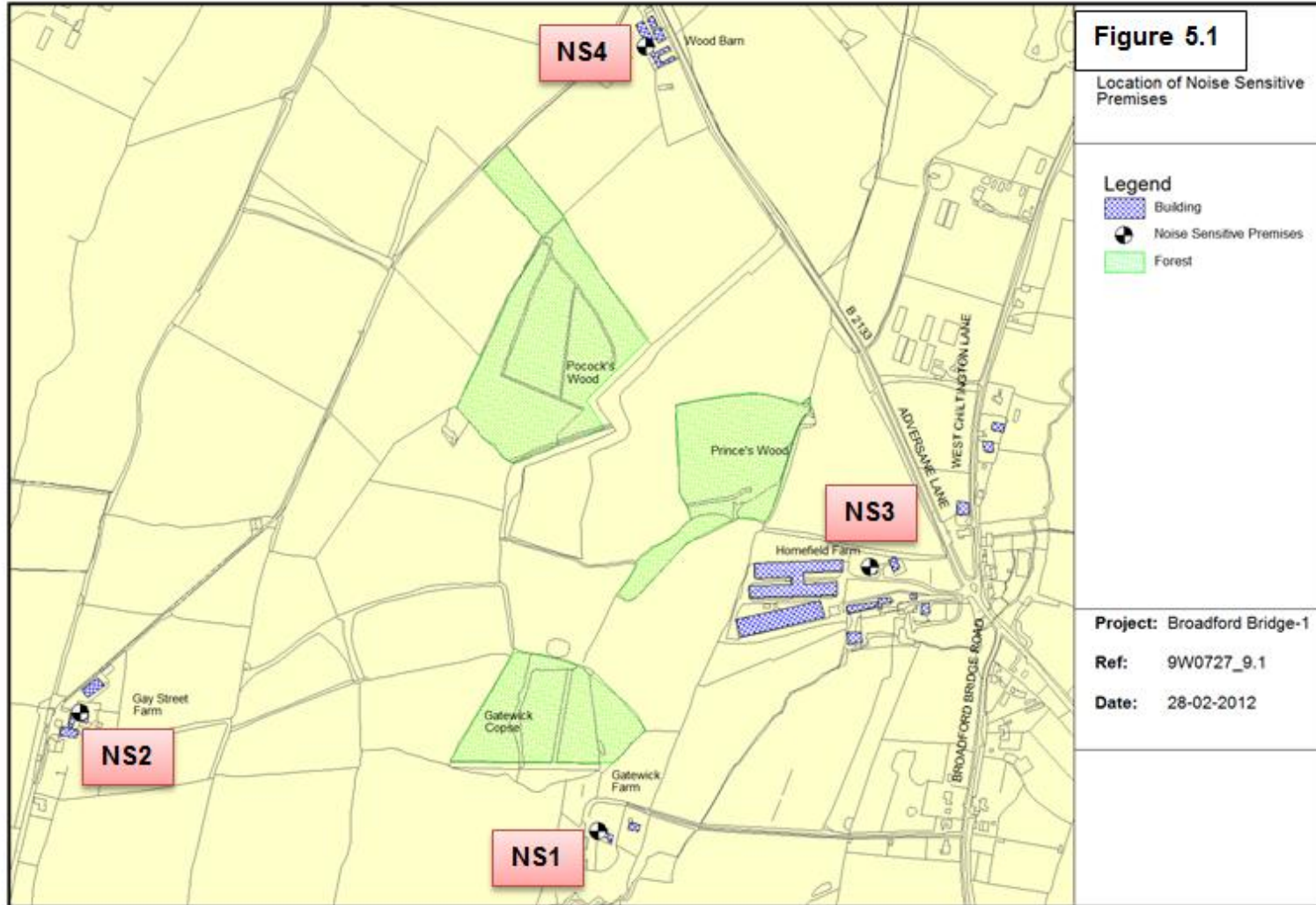
Noise measurements shall be undertaken by a suitably qualified person (possibly with the assistance of calibrated automatic monitoring equipment) at the noise sensitive locations identified above. The noise measurements shall be:

- Undertaken during a normal working day, during typical working hours, avoiding meal breaks and times when plant and equipment within the site or on the access road are not operational;
- Measured over a one-hour period during the normal working day, a fifteen minute period during normal night time operations or over an appropriate time period if in response to specific complaints or ad hoc requests.
- They shall also be measured during a period when the site is not operational, for example during a lunch break or shift change, to enable a comparison to be made between the baseline and construction noise levels.

Noise monitoring shall be flexible in its frequency and will cover all activity. However, as a minimum noise monitoring shall be undertaken:



Figure 5.1: Location of Noise Monitoring



Locations

- At a frequency of once every week during construction and / or drilling operations until it is agreed with the local planning authority that sufficient data has been accumulated to allow agreement that the monitoring frequency can be reduced to once every two to four weeks;
- Immediately after the implementation of any mitigation measures that have been implemented as a result of the Noise Monitoring Scheme or otherwise.

On completion of each noise survey a report shall be made available in a format suitable for submission to the local planning authority. The report shall be submitted within five working days of the scheduled date for monitoring. The report shall contain, as a minimum:

- The results of the noise survey, i.e. noise levels during construction works and noise levels with the site not working, in terms of L_{Aeq} ;
- Details of the instrumentation used including calibration details;
- Details of the prevailing weather conditions on the day of the survey;
- Details of the audibility of the site;
- Details of any extraneous noise sources that influenced the noise climate.

5.5 Non-Compliance with Noise Limits

If the agreed maximum noise levels are exceeded during a survey as a result of construction / restoration or drilling operations at the development or a complaint is received from a local resident, an investigation shall be instigated by the Site Manager within one working day to identify the cause of the non-compliance or complaint.

Such an investigation may involve the identification and cessation of the activity or activities considered to be the cause of the non-compliance/complaint (where operationally safe to do so) and/or the investigation of mitigation measures to reduce the noise emission levels from the activity or activities, for example the replacement of noisy plant with quieter alternatives and/or the use of temporary screens. Any deviation from agreed working practices shall be identified immediately and conformance to the working practice reinstated.

A further noise survey shall be undertaken as soon as possible following the implementation of mitigation to re-assess the noise levels against the guideline noise levels.

The Celtique Drilling Manager will ensure that a complaints response system is maintained by the site, enabling any complaints regarding noise to be reported and appropriate action taken.

5.6 Data Retention

The noise survey data obtained during the routine noise surveys, any complaints made in relation to noise and the resultant investigation following such complaints shall all be documented. Such documentation shall be retained for the full duration of the construction / drilling / restoration operations.