

10.0 NOISE

Introduction

- 10.1 This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of environmental noise and incorporates a summary of the likely effects.
- 10.2 The chapter describes the assessment methodology; the baseline conditions currently existing at the Assessment Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed. This chapter has been prepared by ACIA Engineering Acoustics.

Legislation and Planning Policy

National Legislation

- 10.3 The principal legal control over environmental noise is based on the concept of 'nuisance', contained in Part III of the Environmental Protection Act 1990 (Ref. 10.1). The Act empowers local authorities to deal with noise from premises such as homes, pubs, and factories, and from machinery, equipment and vehicles in the street. Before action can be taken, a Local Authority environmental health professional has to establish that the noise constitutes a statutory nuisance. This means that they have to prove that the noise is causing an unreasonable interference with someone's use of their land or material discomfort to the population at large.
- 10.4 If the environmental health professional is satisfied that a statutory nuisance exists, an Abatement Notice may be served on the person responsible for the problem. Where the notice requires work, a period of time will be given to allow it to be carried out. Failure to comply with the notice after that time is a criminal offence, and the person could be prosecuted. Compliance with the legal requirements not to cause a statutory nuisance is normally dealt with by assessing a development proposal using BS.4142:1997 Method of rating industrial noise affecting mixed industrial and residential areas (Ref. 10.2), as described below.
- 10.5 In the special case of construction equipment, there has for some years been a European Directive restricting the permissible noise emissions from certain types of machinery. The current Directives are 2000/14/EC, which was later amended by 2005/88/EC (Ref. 10.3).

These were enacted into UK law by Statutory Instrument 2001 no.1701, as amended, The Noise Emission into the Environment by Equipment for Use Outdoors Regulations 2001 (Ref. 10.4). The Regulations restrict the permissible sound power emissions of, inter alia, excavators and wheeled backhoe loaders.

Planning Policy Context

National Planning Policy

National Planning Policy Framework (March 2012)

- 10.6 The National Planning Policy Framework (March 2012) (Ref. 10.5) states at paragraph 120 that planning policies and decisions should ensure that new development is appropriate for its location, and the effects of pollution on general amenity should be taken into account. Annex 2 (Glossary) to the NPPF states that pollution can arise from a range of emissions including noise.
- 10.7 Paragraph 123 is specific to issues of noise and states that planning policies and decisions should avoid noise giving rise to '*significant adverse impacts on health and quality of life*'. Policies and decisions should mitigate the adverse impacts through the use of conditions, but it is recognised that development will often create some noise. Areas of tranquillity which have remained relatively undisturbed by noise are to be identified by planning policies and decisions if they are prized for their recreational and amenity value for this reason.
- 10.8 Paragraph 147 describes the responsibilities of minerals planning authorities with regard to onshore oil and gas development. The three phases of development (exploration, appraisal and production) must be clearly distinguished. In noise terms this means that different limits for noise emissions may be appropriate for different phases of a project.
- 10.9 The Technical Guidance to the NPPF (March 2012) (Ref. 10.6) deals with noise emissions from mineral workings at paragraphs 28 and 29. Paragraph 30 defines noise standards for minerals sites as summarised below.
- 10.10 Subject to a maximum of 55dB $L_{Aeq,1hr}$, mineral planning authorities should aim to establish a noise limit that does not exceed the background noise level by more than 10dB. Recognising that this may impose unreasonable burdens on mineral operators, the daytime noise limit should be set as near that level as practicable (07.00h – 19.00h). Evening limits (19.00h – 22.00h) should not exceed background noise by more than 10dB, and night-time limits

should not exceed 42dB $L_{Aeq,1h}$ (free field) at noise-sensitive dwellings. The night-time limit is identical to that in the superseded MPG11 (Ref. 10.7) and MPS2 (Ref. 10.8) guidance, and is also based on the assumption of permanent night-time working.

- 10.11 Annex 3 to the NPPF is a list of documents replaced by the Framework. It includes Planning Policy Guidance 24: *Planning and Noise* (3 October 1994) (Ref. 10.9), and Minerals Policy Statement 2: *Controlling and Mitigating the Environmental Effects of Minerals Extraction in England* which includes its Annex 2: Noise (23 May 2005).

Overarching National Policy Statement for Energy EN-1

- 10.12 The Overarching National Policy Statement for Energy EN-1 (Ref. 10.10) states that Government policy on noise is set out in the Noise Policy Statement for England (Ref. 10.11), which promotes good health and good quality of life through effective noise management. EN-1 goes on to say that factors determining the likely noise impact include *inter alia*:

- The inherent operational noise from the proposed development, and its characteristics;
- The proximity of the proposed development to noise sensitive premises and noise sensitive areas.

- 10.13 EN-1 sets out the requirements for an applicants' noise assessment at paragraph 5.11.4. Where noise impacts are likely to arise from the proposed development, the following points should be included:

- A description of the noise generating aspects of the development proposal leading to noise impacts, including the identification of and distinctive tonal, impulsive or low-frequency characteristics of the noise;
- Identification of noise sensitive premises and noise sensitive areas that may be affected;
- The characteristics of the existing noise environment;
- A prediction of how the noise environment will change with the proposed development:
 - In the shorter term such as during the construction period;
 - In the longer term during the operating life of the infrastructure;
 - At particular times of day, evening and night as appropriate;
 - An assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas; and
 - Measures to be employed in mitigating noise.

- 10.14 The noise impact of ancillary activities associated with the development, such as increased road traffic movements, should also be considered.

British Standards

- 10.15 Operational and construction noise is to be assessed using the principles of the relevant British Standards, including BS.4142, BS.8233 and BS.5228 (Refs. 10.2, 10.12 and 10.13 respectively).

Local Planning Policy

North Yorkshire County Council Adopted Minerals Local Plan Saved Policies (1997) (Ref. 10.14)

- 10.16 Many of the policies forming part of the previous Minerals Local Plan have been saved, which means that they will continue to form part of the statutory development plan for North Yorkshire and provide the local policy framework for development control decisions until they are replaced by policies in the Minerals Core Strategy (Ref. 10.15). Chapter 4 – Environmental Protection has been saved in respect of several issues but none is relevant to noise assessment.
- 10.17 Chapter 7 of the previous Minerals Local Plan dealt with oil and gas, and all policies relating to issues other than transport and noise have been retained. The previous noise policy is no longer valid. This means that although the saved policy requires noise issues to be analysed (paragraph 7.2.5), the noise limits at noise-sensitive properties which neighbour exploration, appraisal and production wells (former Policy 7/1) will no longer apply to new applications.

North York Moors National Park Authority Core Strategy and Development Policies (2008) (Ref. 10.16)

- 10.18 The Core Strategy and Development Policies were formally adopted on 13 November 2008 following an Examination in Public by a Government-appointed Inspector. Environmental noise does not appear as an issue in these policies.

Discussion

- 10.19 The noise assessment will reveal possible impacts on local amenity but there are no absolute limits against which the noise levels in the community resulting from construction, operational and decommissioning or restoration phases of the project can be judged.
- 10.20 It is therefore necessary to judge the likely impact of noise from the various stages of the Proposed Development empirically, based on practical experience.

Assessment Methodology

Background Noise

- 10.21 The pre-existing background noise levels had been determined on previous occasions, with a four-hour night-time noise survey having been carried out in December 2004 as part of the planning submission for the Ebberston Moor 'A' drilling site (NYM/2005/0254/FL). These background noise levels were expected to be representative of present-day conditions and it was necessary only to verify this by means of brief checks of the minimum background noise levels at local noise-sensitive properties. The checks took place on 5 and 6 November 2012. An integrating data-logging sound level meter (Rion type NL-32) fitted with an outdoor microphone protection system (double windshield) was used, with the microphone positioned 1.2m above the ground. The meter was subject to field calibration checks using a suitable electronic calibrator and no drift was observed. The meter had been subject to a laboratory calibration traceable to national standards on 23 March 2012.

Assumptions for Calculations

- 10.22 The following scenario was assumed for noise prediction work. For the normal, operational phase at the Ebberston Moor 'A' Well Site and the adjacent Lockton Compound (together forming the Assessment Site), all equipment is assumed to be operating continuously. Equipment designated for emergency use only is assumed not to be running.
- 10.23 In order to assess the noise emitted during construction, up to three items of machinery — a backhoe loader, a 360° excavator, and a packaged generator set — were assumed to be in operation simultaneously. This will be the 'worst case' scenario and will apply when there is no wind, or a slight wind from the Proposed Development towards the noise receptor. A more typical scenario, where a generator will be operating continuously but the excavator and backhoe loader only for 25% of a given hour, was also assessed using BS.5228-1:2009 Code

of practice for noise and vibration control on construction and open sites (Ref. 10.13). There will also be sporadic use of other equipment and machinery including a portable compressor, fabrication equipment, cranes and mechanical handling equipment, and movements of heavy goods vehicles (HGVs) delivering materials to site.

- 10.24 For both permanent operations and temporary construction, and decommissioning and restoration works, the noise levels were calculated from first principles, whereby the sound pressure level L_{pr} at a known distance r metres from a source is found from the sound power level L_w using the relationship

$$L_{pr} = L_w - 20 \log r - 8 - \Sigma A \quad [dB].$$

Where ΣA is the sum of all excess attenuations resulting from ground effects, atmospheric absorption, and screening, all of which are frequency dependent. Pipework noise is a special case, because from some viewpoints there may effectively be a linear source rather than a point source, so a geometric attenuation of $10 \log r$ was used instead of $20 \log r$.

Noise Source Locations

Construction and Decommissioning and Restoration

- 10.25 The potential noise sources during construction, decommissioning and restoration will move around the Assessment Site and will vary from time to time. For prediction purposes the sources were lumped together at two reference locations as appropriate: (C1) between the existing well (Eberston Moor – 1) and well cellar on the existing Eberston Moor 'A' Well Site and (C2) in the geometric centre of the proposed Gas Conditioning Building, within the Lockton Compound as shown on **Figure 10.1**. The OS grid references of these locations are shown in **Table 10.1**.

Table 10.1: Construction and decommissioning and restoration noise source locations for predictive work

Reference	Location	Easting	Northing
C1	Eberston Moor 'A' Well Site	489907	489687
C2	Lockton Compound	489961	489755

- 10.26 In view of the separation distances involved between the noise sources and any receptor, there will be additional attenuation of sound as it passes over soft ground. This additional attenuation is dependent on frequency, so in the case of construction it was assessed on the

assumption that the noise emissions are typical of the large diesel engines used in construction machinery.

Operation

10.27 The approximate location of each item of plant that is a potential noise source was taken from layout drawings of the intended equipment (**Figure 4.1**) and the OS grid coordinates adopted for noise prediction purposes are shown in **Table 10.2** and **Figure 10.1**. Where there is more than one similar noise source, all are lumped together for prediction purposes. The separation distances between the Proposed Development and the nearest noise-sensitive receptors are sufficiently great that no significant inaccuracy will result from this approximation.

Table 10.2: Operational noise source locations for predictive work

Reference	Location	Easting	Northing
P1	between wellheads	489907	489687
P2	Gas Conditioning Building	489961	489755
P3	transfer pumps	489976	489786
P4	ground-level pipework	489935	489739
P5	metering skid	489938	489727
P6	gas-fuelled 1000kW generator	489953	489698
P7	flare	489869	489590

10.28 In view of the separation distances involved between the noise sources and any receptor, there will be additional attenuation of sound as it passes over soft ground. This additional attenuation is dependent on frequency. In the case of gas processing equipment, small pumps and pipework, the additional attenuation of sound as it passes over soft ground depends on the assumption of a source height applicable to each particular source.

Road traffic noise

10.29 Noise from road traffic movements is usually predicted with reference to the Department of Transport's 1988 document Calculation of Road Traffic Noise (CRTN) (Ref. 10.17) which is designed to assess the changes in road traffic noise arising from a new road or a modified carriageway. Its usefulness in the present project is limited, but equations are given in CRTN which relate the resulting noise levels at housing to the number of vehicle movements expected. No changes in the highway layout are proposed as part of the Proposed Development, so the only potential changes in noise level from the road network are those arising from increases in the numbers of vehicle movements during the construction phase.

During normal production there will be a maximum of five heavy goods vehicles (HGVs) visiting the Assessment Site each day.

Noise-sensitive receptors

10.30 The only potential noise-sensitive receptors identified in this study are private dwellings. Agricultural and industrial buildings are not regarded as noise-sensitive in this context, and there are no schools or hospitals close enough to the Proposed Development to require consideration in terms of noise. In general, only dwellings within 1 km of the Assessment Site were considered to be within the scope of the noise prediction. Preliminary calculations showed that no noise whatsoever would be audible above background at greater separation distances even at the quietest times of night. The OS grid coordinates of the noise-sensitive receptors are shown in **Table 10.3**. The grid references shown are within the curtilage of each property, typically on the side facing the Proposed Development, as shown on **Figure 10.2**. The typical minimum separation distance between site construction plant and each location are also shown in the table.

Table 10.3: Noise-sensitive receptors for construction and decommissioning and restoration noise calculations

Ref.	Receptor Location for construction and decommissioning and restoration noise:	Easting	Northing	Closest approach distance	
				to C1	to C2
R1	Ebberston Common Farm	490077	489434	304m	341m
R2	South Moor Farm	490451	490328	775m	688m
R3	Jingleby Thorn	489370	489546	555m	627m

10.31 **Table 10.4** shows the separation distances between each item of operational equipment (**Table 10.2**) and the same three noise receptor locations.

Table 10.4: Separation distances for operational noise calculations

Ref.	Receptor Location for operation noise	Closest approach distance						
		to P1	to P2	to P3	to P4	to P5	to P6	to P7
R1	Ebberston Common Farm	304m	341m	366m	336m	324m	292m	260m
R2	South Moor Farm	775m	688m	656m	718m	724m	735m	871m
R3	Jingleby Thorn	555m	627m	652m	597m	596m	602m	501m

Significance Criteria

10.32 An individual's sensitivity and reaction to external noise varies according to the perceived loudness of the noise, its character, and the context in which it is heard. In terms of the present study, noise could affect residential amenity, meaning that the enjoyment of property is adversely affected, or could affect sleep, either because noise is audible in bedrooms at night or because sudden noise 'events' wake up a sleeper. A permanent development that was expected to increase the existing background noise level so as to affect amenity would not in general be permitted. The number of properties likely to be affected is also a consideration, and the planning process seeks to balance loss of amenity against the wider public interest. **Table 10.5** shows the definitions of significance applied in this assessment, ranging from 'critical' to 'none'.

Table 10.5: Significance criteria

Significance	Criterion
Critical	These effects are generally, but not exclusively, associated with sites and features of national or regional importance. A change in a regional or district scale feature may also enter this category. Mitigation measures are unlikely to remove such effects. It is inconceivable that noise impacts would ever fall within this category.
Major	These effects are likely to be important considerations at a local or district scale, but if adverse, are potential concerns to the project, depending upon the relative importance attached to the issue during the decision-making process. Mitigation measures and detailed design work are unlikely to remove all of the effects upon the affected communities or interests.
Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource. They represent issues where effects would be experienced but mitigation measures and detailed design work would ameliorate/enhance some of the consequences upon affected communities or interests. Some residual effects would still arise.
Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in enhancing the subsequent design of the proposed development and consideration of mitigation or compensation measures.
None	No effects or those which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Noise limits

10.33 The public response to noise arising from the Proposed Development depends on the pre-existing level of background noise, the amount by which the 'new' noise exceeds it, and the duration of any increase in noise levels. Noise from short-term activities is more acceptable than noise at the same level from more permanent activities. Noise during the evening and at night is less acceptable than the same noise occurring during the normal working day.

Construction noise

- 10.34 No fixed limits apply to construction noise in the UK. BS.5228-1:2009 *Code of practice for noise and vibration control on construction and open sites* (Ref. 10.13) is the usual source of guidance on construction noise. It is usual to establish a daytime noise limit of 55dB $L_{Aeq,1h}$ outside neighbouring residential property but much stricter limits outside normal working hours (07.00h – 19.00h daily). Short-term increases over this level can be acceptable.
- 10.35 BS.5228-1 requires that all available techniques should be used to minimise the levels of noise to which site neighbours are exposed, as far as is appropriate. These techniques include planned hours of working, taking into account the likely consequence of any lengthening of the work periods; the use of quiet working methods including the use of the most suitable plant, and economy and speed of operations; the control of noise at source where practicable; and on-site noise monitoring to an agreed method. It is open to Local Planning Authorities to specify site noise limits and working hours. Moreover, the Local Planning Authority has powers under Section 60 of the Control of Pollution Act 1974 (Ref. 10.18) and the Environmental Protection Act 1990 (Ref. 10.1) to control noise (and vibration) from construction sites.

Operational noise

- 10.36 The North York Moors Core Strategy and Development Policies (2008) (Ref. 10.16) states that development would only be permitted where there would be no adverse effects arising from sources of pollution which would impact on the health, safety and amenity of the public and users of the development, and where it would not generate unacceptable levels of noise or vibration. In this context, 'unacceptable' levels of noise from a facility operating 24 hours a day, seven days a week can be regarded as synonymous with 'audible' level of noise. In other words, the Proposed Development should be designed so as not to increase the levels of continuous noise outside noise-sensitive receptors.
- 10.37 In terms of noise limits, this objective presents a problem because the noise levels arising from the Proposed Development in normal production will not be measurable above background noise at the relevant receptor locations. It is therefore considered appropriate to impose a noise limit at the site boundary. Such a limit may be derived taking as a starting point an acceptable noise level at the nearest receptor location, and determining by calculation what the corresponding noise level would be at the site boundary. This point is discussed later in the Chapter.

Decommissioning and Restoration

- 10.38 The provisions of BS.5228-1(Ref. 10.13) will also apply to the decommissioning phase of operations on site, whichever of the two potential scenarios described in Chapter 6 is appropriate, and to site restoration activities.
- 10.39 The first decommissioning and restoration scenario occurs if future planning permission for the second phase of Eberston Moor 'A' Well Site is secured. This will necessitate a relatively brief period of activity on site in which the flare, and redundant equipment on the Lockton Compound are removed and the site restored to its current condition, but the wellhead and other equipment on the Eberston 'A' Well Site is retained for re-use. The major noise sources during this process will be earthmoving machines, as stone is removed and the earth bunds levelled.
- 10.40 The second decommissioning and restoration scenario occurs if planning permission for the second phase of Eberston Moor 'A' Well Site is not secured before the end of the life of this Proposed Development. During this scenario a restoration scheme for the well site will be agreed in writing with the NYMNPA, but it is likely to take longer on site than the first scenario because the general aim would be to return the entire site to forestry (or to a combination of forestry and amenity uses) in a condition as close as practicable to its original state. Again, this will primarily be an earthmoving exercise following the dismantling of equipment.
- 10.41 In either scenario, a first approximation of the noise levels at the nearest noise-sensitive receptors is that decommissioning and restoration noise will be comparable with construction noise. It is open to Local Planning Authorities to specify site noise limits and working hours or to use its powers under Section 60 of the Control of Pollution Act 1974 (Ref. 10.18) and the Environmental Protection Act 1990 (Ref. 10.1) to control noise (and vibration) from demolition and site reinstatement.

Vibration

- 10.42 Given the separation distances between the Proposed Development and the nearest residential properties, a brief qualitative assessment was conducted. There will be no sources of significant ground vibration during the construction, operational or decommissioning and restoration phases of the Proposed Development. There are no known instances where the construction, operation or decommissioning and restoration of this type of project gives rise to discernible vibration at a dwelling hundreds of metres distant. If no vibration is discernible

to a human observer, there is no possibility of any physical damage to property. No further assessment was therefore made.

Baseline Conditions

Background noise levels

Previous noise surveys

- 10.43 During the course of gas exploration and development in North Yorkshire over the past 25 years, several surveys of the background noise levels outside local residential properties have been conducted. Whilst the results are to some extent dependent on the exact location of the survey, the common findings are that the night-time background noise levels at local residential properties can be very low indeed, with measured $L_{A90,5min}$ values below 20dB.
- 10.44 A noise survey specific to the Assessment Site was conducted between midnight and 04.00h on 2 December 2004 in connection with the previous planning application for a drilling site at Ebberston Moor. Background noise levels were measured at the farm entrance to Ebberston Moor Farm and the results were consistently in the range 17 to 20 dB $L_{A90,5min}$ for the entire four-hour period. The equivalent continuous noise level $L_{Aeq,5min}$ varied from 20 to 27 dB over the same period, with a median value of 24dB.
- 10.45 Brief noise surveys were conducted on 5 and 6 November 2012 in connection with the Proposed Development, with the intention of confirming the presence or absence of any significant noise sources which would otherwise have been undetected. No such sources were found. The typical daytime noise levels at Ebberston Moor Farm, South Moor Farm and Jingleby Thorn were in the range 30 to 35 dB $L_{A90,5min}$, and the typical night-time noise levels on a calm dry night were again in the range 18 to 20 dB $L_{A90,5min}$. It was therefore confirmed that the minimum noise levels previously measured had not changed in the intervening period and were indeed representative of the quietest conditions likely to occur.
- 10.46 Daytime noise levels vary according to the time of year, weather, the activities of wildlife and farm animals, and events resulting from human activity including sporadic road vehicle movements, aircraft over-flights and agricultural operations. On a dry and reasonably calm day, the typical noise levels in the absence of such noise 'events' are in the range 30 to 35 dB $L_{A90,5min}$. In windy or wet conditions the background noise level can safely be assumed to be higher because of rustling of vegetation, the noise of light objects being blown around, and the sound of rainfall. Wet weather generally increases the levels of background noise as

a result of traffic on wet roads, but the Proposed Development is far enough from the major road network for this not to be a factor.

Other considerations

10.47 Ebberston Common Lane is subject to occasional large vehicle traffic movements associated with the operation of a recycling/composting facility at Givendale Head Farm. Refuse lorries bring material northwards along Ebberston Common Lane for recycling at the farm, and return empty. The numbers of such lorry movements are variable, but from casual observation they average about one lorry (two movements) an hour on weekdays. The residential property at Givendale Head (R4, 489444E, 487593N) about 2 km south of the Proposed Development, is the only dwelling that will be subject to additional regular movements of HGV traffic at close quarters. Individual lorry movements will always be more than 200m away from the three potentially noise-sensitive locations listed in **Table 10.3**, and the farmhouse at High Scamridge Farm (R5, 498636E, 487712N). Locations R4 and R5 are shown on **Figure 10.2** for reference.

Likely Significant Effects

Construction

10.48 The noise levels resulting from construction activities on the Assessment Site, which will normally occur only during daytime working hours (07:00 to 18:00 Monday to Friday and 07:00 to 13.00 on Saturdays), are shown in **Table 10.6**. The predictions are based on typical sound power levels for construction machinery: a backhoe loader emits an equivalent continuous sound power level of 112dB(A); a 360° excavator 114dB(A); and a 'silenced' package diesel generator 97dB(A).

Table 10.6: Predicted noise levels during construction, $L_{Aeq,1h}$ dB

Ref.	Source Location (continuous)		Source Location (allowing for on-time)	
	at C1	at C2	at C1	at C2
R1	51	50	46	45
R2	38	40	33	35
R3	43	41	37	35

10.49 The levels in **Table 10.6** are comfortably within the 55dB limit level suggested by the Technical Guidance to the NPPF (Ref. 10.6), and the limit for construction noise in BS.5228 part 1:2009 (Ref. 10.13).

- 10.50 The predicted construction noise levels are of moderate adverse significance in terms of their effect on the amenity of local residents. The limits in BS.5228-1 are not intended to result in zero significance, since the transient nature of construction noise is understood and taken into account.

Road traffic noise

- 10.51 During the construction phase there will be an increase in vehicular traffic along Ebberston Common Lane and some noise from heavy goods vehicles travelling on the public highway is unavoidable. At this stage it is not possible to state exact numbers, because the construction programme cannot be determined until the front-end engineering design (FEED) study has been completed. There are likely to be no more than two or three additional vehicle movements per hour during the normal working day and on Saturday mornings during the construction period.
- 10.52 Each vehicle will pass along Ebberston Common Lane past Givendale Head Farm, 2 km to the south of the Proposed Development. The increase in traffic noise in terms of $L_{Aeq,16h}$ (the usual parameter) resulting from these movements past Givendale Head Farm cannot readily be calculated because the overall traffic flows are very low. Individual vehicle movements will give rise to localised increases in noise level for a matter of seconds. The noise levels from lorry movements received at the three noise-sensitive receptors identified in **Table 10.3** will have a negligible effect on the daytime ambient noise levels because of the effects of intervening distance.

Operation

- 10.53 The noise levels resulting from the normal operation of the Proposed Development were calculated assuming that all equipment runs continuously, 24 hours a day, seven days a week. In fact, subject to gas production and demand, there may be times of little or no activity and the noise levels will then be considerably lower.
- 10.54 The sound power levels from operational plant will depend on the chosen vendors for individual items. The exact models of rotating machinery will be the subject of a competitive bid process and will be informed by the results of the FEED study. For present purposes the assumed sound pressure levels at a distance of 1m are shown in **Table 10.7**. It is quite usual in the oil, gas and petrochemicals industry for a plant to be designed to meet specific noise limits — either at the site boundary, or at local noise-sensitive locations — because it is not possible to compute the noise levels under operational conditions unless good quality noise input data are available. Such data are received by the engineering team during the

course of the enquiry and procurement stage, and maximum noise levels from individual packages can be written into supply contracts. It is common for noise witness tests to take place during acceptance testing of equipment.

Table 10.7: Assumed noise emissions from plant

Reference	Location	L _{Aeq,t} dB at 1m	Notes
P1	Wellheads	25	based on existing N Yorkshire wellhead sites
P2	Gas Conditioning Building	45	all packages inside building
P3	transfer pumps	55	each pump (one runs at a time)
P4	ground-level pipework	50	typical value
P5	metering skid	45	based on similar installations
P6	gas-fuelled generator	70	typical noise-reduced containerised unit
P7	flare	70	maximum likely level

10.55 The typical continuous noise levels at the sensitive receptors resulting from the operation of all plant in **Table 10.7** are shown in **Table 10.8**.

Table 10.8: Operational noise levels at receptors

Reference	Location	L _{Aeq,t} dB
R1	Ebberston Common Farm	20
R2	South Moor Farm	12
R3	Jingleby Thorn	15

10.56 The levels in **Table 10.8** are at or below the minimum levels of background noise expected in the locality. They are therefore of no significance in terms of their effect on the amenity of local residents.

10.57 People passing the Proposed Development on Ebberston Common Lane as part of leisure activities, whether on foot, horseback or bicycle, will be subject to noise at levels not exceeding 60dB(A) at their closest approach to the Assessment Site. There is no reason to suppose this will detract from the leisure experience, and there are no health implications. In terms of these activities the operation of the Proposed Development is of minor adverse significance.

Road traffic noise

10.58 During normal production there will be a maximum of five vehicles visiting the Proposed Development each day to remove gas treatment fluid and by-products. These vehicle movements will not be readily audible at any of the three noise receptors identified. Each vehicle will pass along Ebberston Common Lane past Givendale Head Farm and will cause a brief temporary increase in the noise level there while they pass. However, Givendale Head

Farm is already subject to sporadic lorry noise as a direct result of its own recycling operations, and the addition of HGV movements generated by the operation of the Proposed Development will have no material effect in the long term, so road traffic noise associated with the Proposed Development is of no significance.

Decommissioning and Restoration

- 10.59 The levels of noise arising during decommissioning (dismantling and removal of plant) and site restoration (primarily earthworks) for either scenario, as described in Chapter 6, will at worst be no greater than those arising during site construction, with earthmoving machinery being the greatest sources of sound power. The values in **Table 10.6** also represent the maximum $L_{Aeq,1h}$ from levelling and grading the site after operational equipment has been removed. The predicted noise levels are of moderate adverse significance in terms of their effect on the amenity of local residents.
- 10.60 During the decommissioning phase there will be an increase in vehicular traffic along Ebberston Common Lane and some noise from heavy goods vehicles travelling on the public highway is unavoidable. At this stage it is not possible to state exact numbers, because the programme of decommissioning, dismantling and site works is unknown. However, the worst case scenario will occur if planning permission for the second phase of Ebberston Moor 'A' Well Site is not secured before the end of the life of this Proposed Development: in that case the numbers of HGVs using Ebberston Common Lane will be comparable with the numbers during the construction phase, with similar temporary effects on environmental noise.

Mitigation Measures

Construction

- 10.61 No mitigation measures are necessary beyond the usual good practice recommended in BS.5228-1:2009 (Ref. 10.13), which states that good relations with people living and working in the vicinity of site operations are of paramount importance. People will be kept informed of progress by the appointment of a responsible person to liaise with the public. In general, the longer the duration of on-site activities, the more likely noise is to be an issue. Good public relations are important, as local residents are often willing to accept higher levels of noise if they know that such levels will only last for a short time.
- 10.62 Quiet working methods will be adopted and implemented through the Construction Environmental Management Plan (CEMP). They will include the use of the most suitable

plant and reasonable hours of working for noisy operations. Noise will be controlled at source and on-site noise levels monitored regularly. The local authority may consider it appropriate to lay down or agree work programmes and periods of use of certain equipment which will be specified prior to construction.

- 10.63 General measures to reduce noise levels at source include the avoidance of unnecessary revving of engines, switching off equipment when it is not required, minimising the drop height of materials, and starting up plant and vehicles sequentially rather than all together. Audible reversing alarms should be of types that have a minimum noise effect on persons outside the Assessment Site.
- 10.64 Noise from construction will be controlled primarily by the restriction of working hours. It will be usual practice to allow potentially noisy activities only during the normal working week and on Saturday mornings, subject to local requirements. In this case, 07.00 to 18.00, Monday to Friday and 07.00 to 13.00 Saturday will be appropriate working hours as discussed in Chapter 6.

Operation

- 10.65 The noise limit necessary to achieve the predicted contribution from the Proposed Development (i.e. to ensure that there is no audible noise above background) at the nearest noise-sensitive receptor, Eberston Common Farm, is 60dB $L_{Aeq,5min}$ at any point on the Assessment Site boundary. This limit was derived from consideration of the resulting contribution of the Proposed Development to the overall noise level (plant plus background) at that location, and can therefore be achieved by the proposed design.
- 10.66 No additional mitigation measures are necessary, but at the equipment procurement stage the design team must confirm that all plant operating together can achieve the proposed noise limits. The most significant contributor to environmental noise is the natural gas-fuelled electricity generator, and particular attention will be paid to the noise control equipment fitted to this unit. The assumed sound power output is approximately 90dB(A) and this must be considered the maximum acceptable. Lower levels are desirable in order to ensure that the suggested boundary noise limit is met.

Decommissioning and Restoration

- 10.67 As is the case for construction, quiet working methods will be adopted and implemented through the CEMP for decommissioning and restoration for either scenario. Measures will

include the use of the most suitable plant and reasonable hours of working for noisy operations. Noise will be controlled at source and on-site noise levels monitored regularly. It may be appropriate to lay down or agree work programmes and periods of use of certain equipment, but since these cannot be specified at present such programmes should be subject to discussion and agreement with the local authority when the time comes.

Residual Effects

Construction

- 10.68 There will be no residual noise effects as a result of construction activities.

Operation

- 10.69 Residual noise effects resulting from the operation of the Proposed Development will be of minor adverse significance. Members of the public passing the Assessment Site on foot, by bicycle or on horseback along Dalby Forest Drive may be aware of noise emissions from the gas processing plant, but in the daytime and daylight evenings, noise will only be audible above the normal ambient noise levels within a few tens of metres of the Assessment Site boundary. Resident neighbours will not be affected by noise from the operational facility at any time and residual noise effects are of no significance.
- 10.70 Traffic noise emissions associated with the operation of the Proposed Development are negligible, as there will only be small numbers of vehicles associated with the operational phase.

Decommissioning and Restoration

- 10.71 There will be no residual noise effects as a result of decommissioning and site restoration activities.

Cumulative Effects

- 10.72 There are no cumulative noise effects as a result of the possible construction and operation of the Ryedale Gas Project whilst the Proposed Development is in operation. This is because none of the three residential properties close to the Proposed Development, and listed in **Table 10.3**, are likely to be affected in any way by noise from the Ryedale Gas Project.

Summary

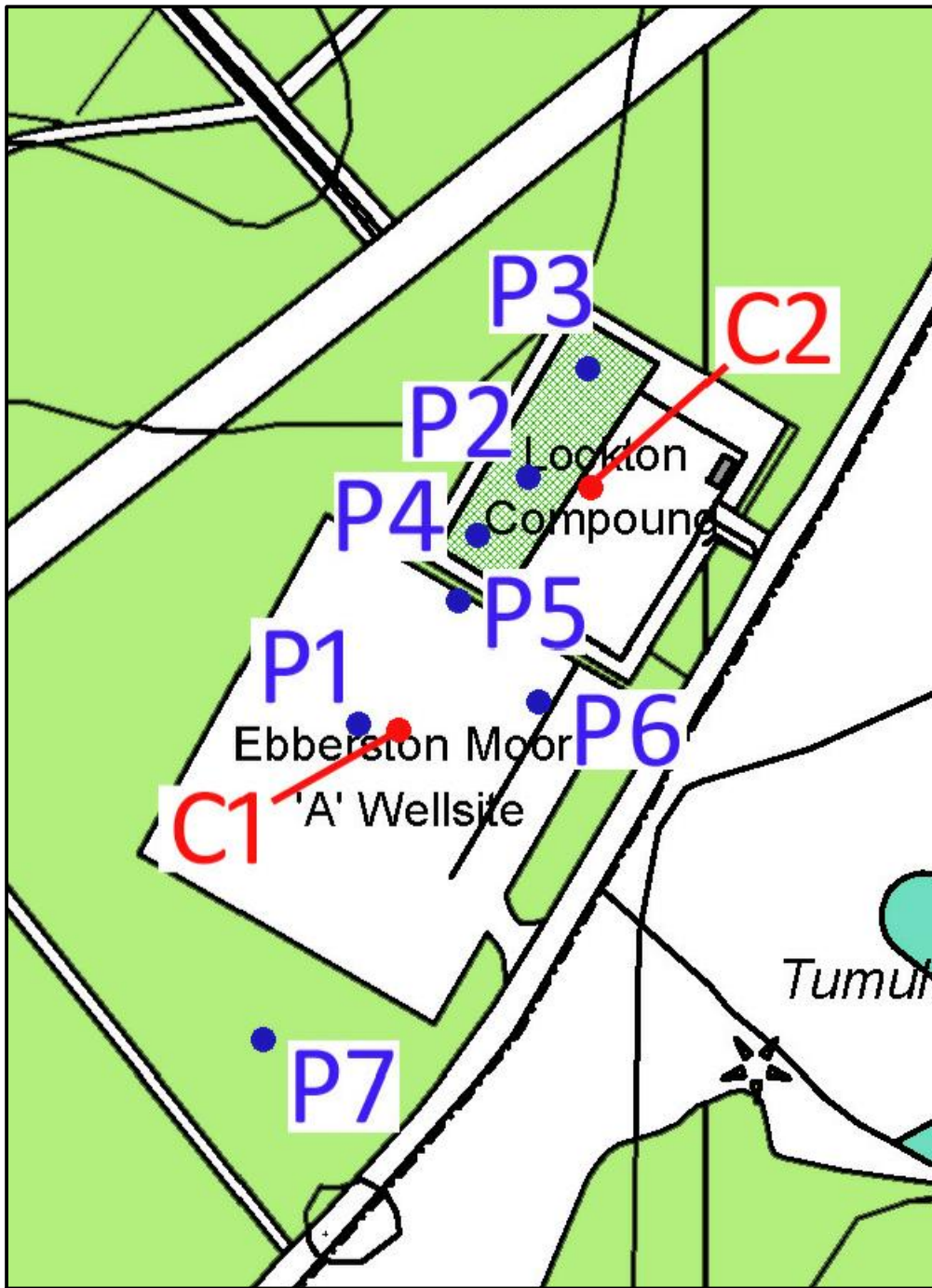
- 10.73 Construction noise may be audible at the nearest noise-sensitive receptors in some circumstances. However, the levels of such noise will be completely acceptable with regard to the usual standards, and the recommendations of BS.5228-1 (Ref. 10.13) can be implemented to reduce noise levels to a minimum. Working hours will be restricted by planning conditions or by mutual agreement in order to ensure that construction noise only occurs during the working day, and never in the evening or at night.
- 10.74 The noise arising from the operation of the Proposed Development will have no significant effect on the residential amenity at local dwellings. Noise limits will be set so that the ambient noise levels outside all existing dwellings are not increased by normal operations on site. Items of noise-emitting plant will be specified and purchased following the FEED study so that the Proposed Development operates within these limits.
- 10.75 **Table 10.9** contains a summary of the likely significant effects of the Proposed Development.

Table 10.9: Table of Significance – Noise

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/ Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/ Minor) (Beneficial/Adverse/ Negligible)
				I	UK	E	R	C	NP	L	
Construction											
Noise nuisance at local noise-sensitive properties	Temporary	Moderate adverse	Restriction of operating hours							*	None
Increased road traffic noise at local noise-sensitive properties	Temporary	Negligible	Restriction of operating hours							*	None
Operation											
Noise nuisance and loss of amenity at local noise-sensitive properties	Temporary	Negligible	Limit noise levels by planning condition							*	Negligible
Increased road traffic noise at local noise-sensitive properties	Temporary	Negligible	Restriction of operating hours							*	Negligible
Increased noise for passers-by	Temporary	Minor adverse	None							*	Negligible
Decommissioning and Restoration											
Noise nuisance at local noise-sensitive properties	Temporary	Moderate adverse	Restriction of operating hours							*	None
Cumulative Effects											
Increased noise from concurrent operation of Ryedale Gas Project	Permanent	Negligible	None							*	None
Increased road traffic noise	Permanent	Negligible	None							*	Negligible

*** Geographical Level of Importance**

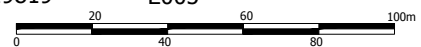
I = International; UK = United Kingdom; E = England; R = Regional; C = County; NP = National Park; L = Local



Project
 Ebberston Moor EDS,
 North Yorkshire

Drawing Title
 Location of Potential Noise Sources

Date	Scale	Drawn by	Check by
10.07.2013	1:2,000 @A4	ML	MC
Project No	Drawing No	Revision	
19819	E005	B	



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Figure 10.1

