



Morven Hawthorn Pit Grid Connection Project

Preliminary Environmental Information Report

Volume 3, Annex 6.2: Onshore Noise and Vibration
Construction Technical Report

MVCNS-J4029-WSP-00040
October 2026
B01

Document status

Version	Purpose of document	Authored by	Checked by	Approved by	Date
B01	PEIR	HJ	VR	LS	October 2026

Prepared by:	Prepared for:
WSP	Morven Offshore Wind Limited

Table of contents

Executive summary	1
1 Introduction	2
1.1 Overview.....	2
1.2 Onshore Noise and Vibration Study Areas	2
1.3 Assessment Criteria.....	3
2 Methodology	6
2.1 Construction noise	6
2.2 Construction vibration.....	9
2.3 Construction traffic	9
2.4 Limitations	10
3 Baseline characterisation	11
3.1 Overview.....	11
3.2 Baseline noise climate	11
3.3 Baseline vibration levels	14
4 Assessment	15
4.1 Construction noise	15
4.2 Construction vibration.....	20
4.3 Construction Road Traffic	21
5 Next steps.....	28
6 References.....	29

List of tables

Table 1.1: Construction and decommissioning noise threshold values based on the ABC Method..	3
Table 1.2: Guidance on effects of vibration levels	3
Table 1.3: Impact magnitude criteria for construction and decommissioning activity vibration	4
Table 1.4: Impact magnitude criteria for road traffic noise during construction (and decommissioning)	4
Table 2.1: Haul road construction	7
Table 2.2: Compound construction	8
Table 2.3: Compound operation during construction	8
Table 2.4: Trenchless technique cable installation	8
Table 2.5: Open cut trenching	8
Table 2.6: LSS construction	8
Table 3.1: Representative noise levels at noise-sensitive receptors	11

Table 4.1: Construction noise threshold distances within which the ABC construction noise thresholds may be exceeded	16
Table 4.2: Summary of magnitude of construction noise impacts where there are potential exceedances in the ABC noise thresholds due to key construction activities	17
Table 4.3: Predicted ground-borne vibration levels	20
Table 4.4: Predicted ground-borne vibration levels	20
Table 4.5: Summary of traffic data used as a basis for the construction stage traffic assessment	23
Table 4.6: Summary of traffic data used as a basis for the construction stage traffic assessment	25

List of figures

Figure 3.1: Noise baseline locations.....	13
Figure 4.1: Onshore Construction Road Traffic Noise – Assessment Road Links	22

Glossary

Term	Meaning
AC connection cables	Alternating Current (AC) cables that will connect the proposed onshore land substation to the National Grid Hawthorn Pit Substation.
Continuous working hours	Where continuous periods of working (up to 24 hours, 7 days per week) are required for construction activities e.g. for Trenchless Technique Installation
Core working hours	Working hours of 7am-7pm, Monday - Friday and 7am - 1pm on Saturday, no activity on Sundays or bank holidays.
Decibel	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in sound pressure level between two sounds is given by $20 \log_{10}$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20 \mu\text{Pa}$.
Free-field	A sound monitoring position is a "free-field" position when it is not affected by sound reflections from surrounding buildings and structures. This corresponds with a position at least 3.5 metres away from reflecting buildings or structures.
$L_{Aeq,T}$	The A-weighted equivalent continuous sound level. It is the notional continuous level that, over the defined time period, T, contains the same sound energy as the actual fluctuating sound that occurred over the same time period.
Morven Hawthorn Pit Grid Connection (MHPGC) Project PEIR Red Line Boundary: Onshore	Spatial extent used to define the environmental assessment within the Preliminary Environmental Information Report (PEIR). The area within which all onshore components of the MHPGC Project will be located landward of Mean High Water Springs (MHWS), including areas required on a temporary basis during construction and/or decommissioning (e.g. construction compounds).
Maximum Design Scenario (MDS)	The realistic, worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the MHPGC Project.
MHPGC Project Environmental Statement (ES)	The document presenting the results of the Environmental Impact Assessment (EIA) process.
MHPGC Project Scoping Opinions	Separate scoping opinions received from the Planning Inspectorate (PINS) (on behalf of the Secretary of State (SoS)) and Marine Directorate – Licencing Operations Team (MD-LOT) (on behalf of the Scottish Ministers) and the Marine Management Organisation (MMO) in response to the MHPGC Scoping Report. The MHPGC Scoping Opinions contain the range of issues that the PINS, and MD-LOT in consultation with statutory stakeholders, have identified should be considered within the EIA process.
MHPGC Project Scoping Report	A Scoping Report for the MHPGC Project, scoping the likely significant effects of the project on the environment, was submitted and accepted by PINS

Term	Meaning
	and submitted to the Scottish Ministers, via the MD-LOT in February 2025.
MHPGC Project PEIR	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (EIA) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project, and which helps to inform consultation responses.
MHPGC Project	The MHPGC Project is comprised of the offshore export cables in Scottish and English waters from the Morven North or the Morven South offshore substation platform(s) (OSP), landfall, onshore export cables, the onshore land substation (LSS) and AC connection cables. Also referred to in this report as the MHPGC Project, for ease of reading.
Number of items	Number of items of plant (or activities, where so assessed) present in assessed work area.
Onshore export cable corridor	The proposed area within which onshore export cables and associated infrastructure will be laid and located, from the Transition Joint Bay (TJB) to the LSS.
Onshore land substation (LSS)	A purpose-built site comprising a compound containing the electrical components for converting the High Voltage Direct Current (HVDC) to High Voltage Alternative Current (HVAC) power. The LSS site associated with the MHPGC Project adjusts the power quality and power factor to meet the requirements of power supply being fed to the National Grid Hawthorn Pit Substation.
Planning Inspectorate (PINS)	The PINS is the government agency that administers and examines Development Consent Order (DCO) applications for Nationally Significant Infrastructure Projects (NSIP). PINS manages the application process, oversees consultation and examination, and makes a recommendation to the SoS on whether consent should be granted.
Onshore Noise and Vibration Study Areas	For each environmental topic, the baseline environment will be characterised, and the likely significant effect will be described within a topic-specific Study Area. Specific Study Areas are defined for each topic and are based on the maximum spatial extent across which likely significant effects of the MHPGC Project may be experienced by the relevant receptors (i.e. Zone of Influence).
% on time	The amount of time that the noise from equipment / plant / activity is present in a nominal assessment period, expressed as a percentage.

Acronyms

Unit	Meaning
AAWT	Average Annual Weekday Traffic
BNL	Basic Noise Level
BPM	Best Practicable Means
BS	British Standard
BS 5228-1	BS 5228-1: 2009+2014: Code of practice for noise and vibration control on construction and open sites – Part 1: Noise
BS 5228-2	BS 5228-2: 2009+2014: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration
CoCP	Code of Construction Practice
CRTN	Calculation of Road Traffic Noise
dB	decibel
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
HDD	Horizontal directional drilling
HGV	heavy goods vehicles
HVAC	High Voltage Alternative Current
HVDC	High Voltage Direct Current
LSS	Onshore land substation
MD-LOT	Marine Directorate – Licencing Operations Team
MDS	Maximum Design Scenario
MHPGC	Morven Hawthorn Pit Grid Connection
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
NSIP	Nationally Significant Infrastructure Projects
NSR	Noise-sensitive receptor
OSP	Offshore substation platform(s)
PEIR	Preliminary Environmental Information Report
PPV	Peak Particle Velocity
PDE	Project Design Envelope
SoS	Secretary of State
TCC	Temporary Construction Compound
TJB	Transition Joint Bay

Units

Unit	Meaning
dB	decibel
dB(A)	A-weighted decibel
dB L _{Aeq,T}	A-weighted equivalent continuous sound level, T denotes the time period over which the fluctuating sound levels were averaged, for example dB L _{Aeq,8hr} is the equivalent continuous sound level over an 8-hour period.
m	Metres
mm/s	Millimetres per second
PPV	Instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position
%	Percent

Executive summary

This document presents the key findings and conclusions of the onshore construction noise and vibration assessment undertaken for the Morven Hawthorn Pit Grid Connection Project (MHPGC Project). This report, forming **Volume 3, Annex 6.2: Onshore Noise and Vibration Construction Technical Report, of the Preliminary Environmental Information Report (PEIR)**, supports the wider assessment outlined in **Volume 3, Chapter 6: Onshore Noise and Vibration, of the PEIR**. The assessment evaluates the potential impacts of noise and vibration generated by construction activities on sensitive receptors within the Onshore Noise and Vibration Study Areas. The assessment also evaluates the potential for changes in road traffic noise from development generated traffic during construction on the local road network.

The methodology adopted for this assessment aligns with relevant British Standards (BS) and technical guidance and adheres to legislative and policy frameworks. The Onshore Noise and Vibration Study Areas include residential properties and community services considered sensitive to changes in noise and vibration levels due to the construction phase of the MHPGC Project. Baseline environmental conditions were established through monitoring of existing noise levels at locations considered representative of the nearest noise sensitive receptors (NSRs) as set out in **Volume 3, Annex 6.1: Onshore Noise and Vibration Baseline Technical Report, of the PEIR**.

Noise impacts were evaluated using the A-weighted equivalent continuous sound level (Decibel (dB) $L_{Aeq,T}$), which reflects the averaged sound energy over relevant time periods. Vibration impacts were quantified by assessing Peak Particle Velocity (PPV), representing the maximum instantaneous velocity reached by a vibrating element. Drawing on the information available at this stage, the assessment considered worst-case scenarios to ensure a robust and precautionary approach.

The results indicate that certain construction activities have the potential to generate noise and vibration levels exceeding established thresholds set out in BS 5228 2009+2014: Code of practice for noise and vibration control on construction and open sites (BSI, 2014) at sensitive receptors nearest to the MHPGC Project, i.e. a moderate to major adverse effect which is significant in EIA terms. However at most receptors the implementation of Best Practicable Means (BPM) will reduce the construction noise and vibration levels below the established thresholds, i.e. a minor to moderate adverse effect which is not significant in EIA terms. The construction noise and vibration assessment will be updated during the EIA as the design of the MHPGC Project continues to develop, including in relation to potential refinement of the areas within which construction activities are anticipated to occur and the recommend secondary mitigation measures to reduce exceedances in established thresholds. The ES will also present details of the construction noise assessment at non-residential NSRs.

The results of the preliminary assessment of construction road traffic show the access road links to Jade Business Park experience the highest noise level changes during peak construction. However there are no residential properties within 50m of the access road links. For the remaining rod links the noise level changes during peak construction are minor, i.e. not significant in EIA terms.

1 Introduction

1.1 Overview

- 1.1.1.1 This report presents the construction noise and vibration assessment for the Morven Hawthorn Pit Grid Connection Project (referred to hereafter as 'the MHPGC Project'). It forms **Volume 3, Annex 6.2: Onshore Noise and Vibration Construction Technical Report, of the PEIR** prepared for the MHPGC Project and supports **Volume 3, Chapter 6: Onshore Noise and Vibration, of the PEIR**.
- 1.1.1.2 This document provides details of the assessment, methodology, and significance of the noise and vibration impacts on nearby sensitive receptors within the Onshore Construction Noise and Vibration Study Areas due to the construction phase of the MHPGC Project.
- 1.1.1.3 The prediction and assessment of construction and decommissioning stage noise has been undertaken based on the guidance contained within British Standard (BS) 5228-1: 2009+2014: Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (BSI, 2014). A series of construction noise level predictions have been undertaken, with the results of these predictions compared against derived assessment criteria. The margin of compliance / exceedance of the assessment criteria has been used to determine whether a significant effect would arise.
- 1.1.1.4 The assessment of construction vibration has been undertaken based on the guidance contained within BS 5228-2: 2009+2014: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (BSI, 2014). Drawing upon the historical ground-borne vibration measurement data, and vibration prediction methods contained within this standard, a series of typical set-back distances have been determined, at which different degrees of human exposure to ground-borne vibration would arise. Set-back distances have been determined for a sample of vibration generating plant. The distances of vibration sensitive receptors from such plant have then been compared with the derived set-back distances to determine whether a significant effect is likely to arise.
- 1.1.1.5 The assessment of construction road traffic noise has been undertaken based the guidance contained within Design Manual for Roads and Bridges (DMRB) LA111 (DMRB, 2020).
- 1.1.1.6 The assessment is informed by the following chapters:
- **Volume 1, Chapter 2: Project Description, of the PEIR;**
 - **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR;**
 - **Volume 1, Chapter 5: Policy and Legislation, of the PEIR;**
 - **Volume 3, Chapter 5: Traffic and Transport, of the PEIR.**
- 1.1.1.7 The chapter also draws on information contained within the following annexes:
- **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR;**
 - **Volume 3, Annex 6.1: Onshore Noise and Vibration Baseline Technical Report, of the PEIR.**

1.2 Onshore Noise and Vibration Study Areas

- 1.2.1.1 Further details on the Onshore Noise and Vibration Study Areas is set out in **Section 6.4.2 of Volume 3, Chapter 6: Noise and Vibration, of the PEIR**. In summary, the Onshore Noise and Vibration Study Areas relevant to the baseline noise survey are defined as follows:
- The Onshore Construction Noise Study Area (as set out within **Figure 6.1 in Volume 3, Chapter 6: Noise and Vibration, of the PEIR**), an area extending 300m from the MHPGC Project PEIR Red Line Boundary: Onshore.
 - The Onshore Construction Vibration Study Area (as set out within **Figure 6.1 in Volume 3, Chapter 6: Noise and Vibration, of the PEIR**), an area extending 100m from the MHPGC Project PEIR Red Line Boundary: Onshore.
 - The Onshore Construction Road Traffic Noise Study Area (as set out in **Figure 6.2 in Volume 3, Chapter 6: Noise and Vibration, of the PEIR**), an area extending 50m from the kerb line of public roads where construction traffic would result in a change in BNL of 1dBA or more, versus the baseline scenario.

1.3 Assessment Criteria

1.3.1 Construction Noise

- 1.3.1.1 Construction and decommissioning activity noise thresholds have been set for noise sensitive receptors using the 'ABC Method' as set out in Annex E of BS 5228-1. This approach sets thresholds for the onset of potentially significant adverse effects depending on the existing ambient noise levels as observed during baseline noise surveys. The criteria by which the ABC Method categories are defined are set out within **Table 1.1**, reproduced from Table E.1 of BS 5228-1.

Table 1.1: Construction and decommissioning noise threshold values based on the ABC Method

Assessment category and threshold value period ($L_{Aeq,T}$)	Threshold value $L_{Aeq,T}$ (dB) (façade)		
	Category A ^(A)	Category B ^(B)	Category C ^(C)
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends ^(D)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level. NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3dB due to site noise. NOTE 3 Applied to residential receptors only.			
(A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values. (B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values. (C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values. (D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.			

- 1.3.1.2 Construction noise thresholds have been determined for each receptor in accordance with the BS 5228-1 'ABC method', as shown in **Table 1.1**, and drawing on the results of the baseline noise surveys presented in **Volume 3, Annex 6.1 Onshore Noise and Vibration Baseline Technical Report, of the PEIR**. Where construction noise levels are below the threshold values for their respective ABC there is the potential for a Negligible to Low impact magnitude to be experienced, i.e. an effect ranging between Minor to Moderate adverse significance. Where construction noise levels exceed the threshold values for their respective ABC Category, there is the potential for a medium to high impact magnitude to be experienced, i.e. an effect ranging between Moderate to Major adverse significance which is significant in EIA terms.

1.3.2 Construction Vibration

- 1.3.2.1 With respect to human exposure to building vibration, Table B1 of Annex B to BS 5228-2 provides guidance on the effects of vibration levels on human beings and this has been reproduced below.

Table 1.2: Guidance on effects of vibration levels

Vibration level (mm/s)	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.

Vibration level (mm/s)	Effect
1.0	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
Notes: [1] The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient. [2] A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available. [3] Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.	

- 1.3.2.2 Construction vibration has been assessed in accordance with the guidance contained in BS 5228-2. The construction vibration threshold criteria for humans which apply are set out in **Table 1.3**. Where construction vibration levels are below 1.0mm/s there is the potential for a Negligible to Low impact magnitude to be experienced, i.e. an effect ranging between Minor to Moderate adverse significance. Where construction vibration levels are equal to or exceed 1.0mm/s, there is the potential for a medium to high impact magnitude to be experienced, i.e. an effect ranging between Moderate to Major adverse significance which is significant in EIA terms.

Table 1.3: Impact magnitude criteria for construction and decommissioning activity vibration

Magnitude of impact	Construction activity vibration level, Peak Particle Velocity (PPV)
Negligible	<0.3mm/s
Low	≥0.3mm/s and <1.0mm/s
Medium	≥1.0mm/s and <10.0mm/s
High	≥10.0mm/s

1.3.3 Construction Road Traffic

- 1.3.3.1 The construction phase of the MHPGC Project has the potential to generate increases in traffic flows or changes in traffic compositions on the local road network as a result of development generated traffic and, where required, temporary diversions. Further details can be found in **Volume 3, Chapter 5: Traffic and Transport, of the PEIR**.
- 1.3.3.2 The change in road traffic noise level for each road link within the Onshore Construction Road Traffic Noise Study Area has then been determined. The magnitude of construction and decommissioning traffic noise related impact has been assessed based on the criteria from Table 3.17 of Design Manual for Roads and Bridges (DMRB) LA111 (DMRB, 2020) as reproduced in **Table 1.4**.

Table 1.4: Impact magnitude criteria for road traffic noise during construction (and decommissioning)

Magnitude of Impact	Change in Basic Noise Level of closest public road during construction traffic (dB)
High	≥ 5.0
Medium	≥ 3.0 and < 5.0
Low	≥ 1.0 and < 3.0
Negligible	< 1.0

- 1.3.3.3 Where the change in road traffic noise are below 3 dB there is the potential for a Negligible to Low impact magnitude to be experienced, i.e. an effect ranging between Minor to Moderate adverse significance. Where the change in road traffic noise levels are equal to or greater than 3 dB, there is the potential for a medium to high impact magnitude to be experienced, i.e. an effect ranging between Moderate to Major adverse significance which is significant in EIA terms.

2 Methodology

2.1 Construction noise

2.1.1 Overview

- 2.1.1.1 This assessment is based on the Maximum Design Scenario (MDS) as presented in **Volume 3, Chapter 6: Onshore Noise and Vibration, of the PEIR** and the Project Design Envelope (PDE) as presented in **Volume 1, Chapter 2: Project Description, of the PEIR**. The preliminary findings of the PEIR are subject to refinement as the design of the MHPGC Project evolves. Therefore, the PEIR assessment considers potential effects of construction noise in terms of indicative distances between receptors and potential areas of construction activity.
- 2.1.1.2 This assessment considers the following construction activities, which are considered representative of the likely main works, relating to the Landfall area, onshore export and AC connection cable corridor and onshore land substation (LSS) Option Areas:
- Haul road construction;
 - Construction compound construction;
 - Construction compound operation during construction;
 - Trenchless technique cable installation;
 - Open cut trenching;
 - LSS construction.
- 2.1.1.3 **Volume 3, Chapter 6: Onshore Noise and Vibration, of the PEIR** also considers the decommissioning stage. At this stage it is anticipated that the onshore export and AC connection cables will be left in place to minimise environmental effects associated with removal. The majority of the activities associated with the decommissioning stage of the onshore LSS construction will be similar to the activities associated with the construction stage but in the inverted sequence. All equipment and materials will be demolished and disposed of. It is likely that the decommissioning activities will generally be similar to or results in less noise and vibration effects than the construction activities. As such, the effect of decommissioning will be represented by considering the construction stage activities and requiring no more mitigation than the construction stage, and with no higher residual effect. Therefore, the decommissioning stage activities are not assessed further in this Annex.
- 2.1.1.4 At this stage, the construction methodologies are not yet known. Indicative plant lists have been derived for each construction activity based on information provided in **Volume 1, Chapter 2: Project Description, of the PEIR**, professional judgement and experience of projects of a similar scale and nature. Assumed noise emissions for each plant have been selected from data within BS 5228-1.
- 2.1.1.5 Construction noise levels have been predicted for each activity in terms of the equivalent continuous noise level, dB $L_{Aeq,T}$. Construction noise levels are predicted in façade conditions, as required by BS 5228-1. Predicted levels represent a position 1m from the façade of a receptor and include a correction of +3dB to account for sound reflections from the receptor building.
- 2.1.1.6 The construction noise calculations incorporate the following assumptions:
- Landfall would extend no further west beyond Starling Way at the junction with the A182;
 - No intervening screening (e.g. From topology, buildings etc) between the construction works and receptors;
 - A 5 dB noise level reduction has been applied to account for embedded mitigation measures, including the adoption of BPM.
- 2.1.1.7 Based on these indicative plant lists and associated construction noise levels, sound propagation calculations in accordance with the methodology presented in Annex F of BS 5228-1 have been undertaken to derive indicative distances within which the ABC Thresholds may be exceeded at residential receptors during daytime, evening and night-time periods for each activity.
- 2.1.1.8 In summary, the assessment of construction and decommissioning noise for residential receptors has included the following steps:
- Identify the nearest NSRs to the construction activity;

- Select a representative sample of the identified NSRs for assessment, ensuring a good geographic spread across the local area;
- Set noise threshold level criteria based on the guidance contained in BS 5228-1, namely, the thresholds detailed in the ABC method;
- Identify the key construction activities, source noise levels for the associated plant for use in the prediction of construction noise and core construction working hours;
- Undertake construction noise predictions for the key construction activities of the MDS to derive indicative distances within which the ABC thresholds may be exceeded at NSRs during daytime, evening and night-time periods for each activity;
- Compare the location of the NSRs with the respective ABC threshold distances and determine the resulting impact magnitude and significance of effect.

2.1.1.9 For non-residential receptors, including noise sensitive ecological receptors, the assessment of construction and decommissioning noise impacts will be undertaken and presented within the ES that accompanies the application for development consent.

2.1.2 Construction Working Hours

2.1.2.1 As set out in embedded commitments, reference CoT03, core working hours for onshore construction works are as follows:

- Monday to Friday: 07:00 to 19:00 hours;
- Saturday: 07:00 to 13:00 hours;
- Up to one hour before and after core working hours for mobilisation ("mobilisation period"), i.e. 06:00 to 07:00 and 19:00 to 20:00 weekdays and 06:00 to 07:00 and 13:00 to 14:00 Saturdays.

2.1.2.2 Specific works, such as the trenchless technique cable installation, may have to be undertaken outside the core working hours. Advance notice of such works will be given to the relevant planning authority where practicable.

2.1.3 Key construction activities and activity sound power levels of associated plant

2.1.3.1 **Table 2.1** to **Table 2.6** presents the breakdown of the indicative construction plant needed to undertake the works for each activity. Sound power levels provided for construction plant and equipment (unless otherwise specified) are reproduced from BS 5228-1.

2.1.3.2 The plant lists are based upon current understanding of the MHPGC Project and on past experience of similar construction projects. A detailed list of the equipment that will be used will not be available until the Principal Construction Contractor is appointed and the design and programme are developed. In the data tables, "number of sources" represents the estimated number of items of named plant items that may be working concurrently.

2.1.3.3 In **Table 2.1** to **Table 2.6**, "percentage on-time" is the estimated proportion of a nominal 12-hour day (four-hour evening or eight-hour night) where the plant is operational and undertaking the described activities (for example, 50% for an excavator would be six hours moving material around, and six hours at rest, on a typical 12-hour day).

Table 2.1: Haul road construction

Item of plant	Number of Sources	Sound Power Level dB(A) per plant item	Percentage on-time (%)
40 t tracked excavator	1	107	90
35 t tracked excavator	2	108	90
29 t articulated dump truck	4	107	25
41 t dozer	1	108	90
Vibratory roller	1	103	90
Tracked crusher	1	110	75

Item of plant	Number of Sources	Sound Power Level dB(A) per plant item	Percentage on-time (%)
Total Sound Power Level, dB(A) = 116			-

Table 2.2: Compound construction

Item of plant	Number of Sources	Sound Power Level dB(A) per plant item	Percentage on-time (%)
35 t tracked excavator	2	108	50
41 t dozer	1	108	50
Vibratory roller	1	103	90
29 t articulated dump truck	4	107	25
Wheeled mobile telescopic crane	1	106	50
Total Sound Power Level, dB(A) = 113			-

Table 2.3: Compound operation during construction

Item of plant	Number of Sources	Sound Power Level dB(A) per plant item	Percentage on-time (%)
Diesel generator	1	89	100
14 t tracked excavator	1	98	50
Total Sound Power Level, dB(A) = 96			-

Table 2.4: Trenchless technique cable installation

Item of plant	Number of Sources	Sound Power Level dB(A) per plant item	Percentage on-time (%)
Horizontal drilling rig	1	116	100
Diesel generator	1	102	100
Dewatering Equipment	1	96	100
Mud Treatment units	1	96	100
Total Sound Power Level, dB(A) = 116			-

Table 2.5: Open cut trenching

Item of plant	Number of Sources	Sound Power Level dB(A) per plant item	Percentage on-time (%)
14 t tracked excavator	2	98	80
23 t articulated dump truck	1	102	50
Vibratory roller	1	103	80
36T Excavator	1	108	80
Total Sound Power Level, dB(A) = 109			-

Table 2.6: LSS construction

Item of plant	Number of Sources	Sound Power Level dB(A) per plant item	Percentage on-time (%)
14 t tracked excavator	4	98	80

Item of plant	Number of Sources	Sound Power Level dB(A) per plant item	Percentage on-time (%)
23 t articulated dump truck	2	102	50
Vibratory roller	2	103	80
Mobile telescopic crane	1	95	50
Concrete pump + cement mixer truck	1	95	50
Large rotary bored piling rig	1	111	50
Total Sound Power Level, dB(A) = 111			-

2.2 Construction vibration

- 2.2.1.1 At this stage, the type and number of vibration-generating construction plant items, the programme and working methodologies to be applied are not known; these would be based on the final design, the ground conditions, and selected by the Principal Contractor, who would be appointed after planning approval.
- 2.2.1.2 Ground-borne vibration calculations have therefore been performed for construction activities typically required for similar developments. The calculations are based on the empirical prediction procedures presented within BS 5228-2.

2.3 Construction traffic

- 2.3.1.1 The results of the Transport Assessment have been used as the basis for determining the change in noise levels arising on existing roads due to construction stage development generated traffic during the peak construction year of 2033. Further details on the Transport Assessment are presented in **Volume 3, Chapter 5: Traffic and Transport, of the PEIR**.
- 2.3.1.2 Road traffic noise calculations have been carried out in general accordance with Calculation of Road Traffic Noise (CRTN) (Department of Transport and Welsh Office, 1988). Basic Noise Level (BNL) calculations have been undertaken for a notional receptor location 10m from the edge of the carriageway of each road considered. A notional receptor has been used because the change in traffic noise level adjacent to any given road will be the same at all distances where noise from that route is dominant. Where the AAWT flow is below the level where the BNL can reliably be predicted (i.e. an AAWT of 1000), the BNL has been calculated using the Noise Advisory Council Method. Traffic noise calculations have been undertaken to establish the change in the daytime $L_{A10,18hr}$ noise level for the peak number of daily trips for each construction route.
- 2.3.1.3 Predictions have been undertaken for the following Scenarios:
- Scenario 1 Baseline: Baseline traffic alone;
 - Scenario 2 Blue LSS Option: Baseline traffic plus traffic during the peak period of construction of the MHPGC Project;
 - Scenario 3 Green LSS Option: Baseline traffic plus traffic during the peak period of construction of the MHPGC Project.
- 2.3.1.4 The traffic data for the assessment has been prepared for the Applicant and is included in **Section 4.3** of this Annex and includes all routes likely to be used during the construction stage of the Project.
- 2.3.1.5 The changes in road traffic noise have been determined by subtracting the noise level determined for Scenario 1, from that determined for “with-development” Scenario 2: Blue LSS Option and Scenario 3 Green LSS Option. The resulting change is therefore that associated with the additional construction traffic movements. Predicted increases in BNL are presented in **Section 4.3** of this Annex.
- 2.3.1.6 HGV traffic is assumed to be evenly distributed throughout the working day for each compound (between 0700 to 1900 Monday to Friday, and 0700 to 1300 on Saturdays). Therefore, only daytime assessment criteria are considered.

2.4 Limitations

- 2.4.1.1 In the absence of detailed information from a construction contractor, assumptions have been made about the types of plant and equipment which are likely to be used for the key construction activities. These assumptions are considered representative of the maximum design scenario.
- 2.4.1.2 The construction vibration predictions have been made using calculations which have been developed in-house (by WSP) and based on BS 5228-2 methodologies. The vibration predictions have been made using empirical data provided in BS 5228-2. However, the accuracy of such predictions is necessarily limited by assumptions that have to be made regarding the number and type of plant used, their location, detailed operating arrangements, and the ground conditions. Whilst this information would be clarified as the detailed design progresses and when resources are mobilised, other information (such as exactly where the plant operates and for how long) would remain uncertain, even after works have commenced. It has therefore been necessary to perform a construction stage vibration assessment, focussing on key activities, with the aim of identifying whether significant temporary vibration effects are likely to arise at the closest sensitive receptors.
- 2.4.1.3 Traffic surveys may not account for short-term network changes, including recent developments, highway works or changes in regulation which have occurred since the survey period.
- 2.4.1.4 Future baseline traffic conditions have been established by applying the DfT's TEMPro growth factors which reflect regional trends, but do not account for changes in travel behaviour or future policy interventions.

3 Baseline characterisation

3.1 Overview

- 3.1.1.1 The following section presents an overview of the Construction Noise and Vibration Study Areas and the baseline noise climate at noise-sensitive receptors.
- 3.1.1.2 Further details and results of the environmental noise survey are presented in **Volume 3, Annex 6.1: Onshore Noise and Vibration Baseline Technical Report, of the PEIR**. The scope and measurement locations adopted during the survey were agreed with Environmental Health of Durham City Council (DCC).

3.2 Baseline noise climate

- 3.2.1.1 The baseline in relation to onshore noise and vibration is outlined within **Volume 3, Chapter 6: Onshore Noise and Vibration, of the PEIR** and **Volume 3, Annex 6.1: Onshore Noise and Vibration Baseline Technical Report, of the PEIR**.
- 3.2.1.2 A summary of the existing noise climate at receptors within the Construction Noise and Vibration Study Areas is presented in **Table 3.1** and shown in **Figure 3.1**.

Table 3.1: Representative noise levels at noise-sensitive receptors

Receptor group ID	Receptor name	Measurement location ID	Ambient noise level, dB L _{Aeq,T} (free-field conditions)	
			Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
R01	Cold Hesledon South Residential	ST4	68	54
R02	Cold Helsedon North Residential	ST4	68	54
R03	Cold Hesledon East Residential	ST5	53	41
R04	Hillcroft Residential	ST6	57	49
R05	Spectrum Business Park South West	ST6	57	39
R06	Spectrum Business Park South	ST6	57	39
R07	Spectrum Business Park Central and North	ST6	57	39
R08	Kinley Hill Farm	ST7	52	32
R09	Kinley Hill Tower	ST7	52	32
R10	Kinley Hill Farm Residential	ST7	52	32
R11	Hawthorn Dene Residential	ST7	52	32
R12	Hawthorn North Residential	ST9	50	39
R13	Hawthorn Central Residential	ST9	50	39
R14	St Michael and All Angels Church	ST9	50	39
R15	Hawthorn South East Residential	ST9	50	39
R16	Hawthorn North West Residential	ST8	58	44
R17	Hawthorn West Residential	ST8	58	44
R18	Hawthorn South West Residential	ST8	58	44
R19	East Batter Law Farm Residential	ST8	58	44
R20	West Batter Law Farm Residential	LT3	52	45

Receptor group ID	Receptor name	Measurement location ID	Ambient noise level, dB $L_{Aeq,T}$ (free-field conditions)	
			Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
R21	Little Coop House Farm Residential	ST2	42	42
R22	Great Co-op House Farm Residential	ST1	61	44
R23	Carr's Farm Residential	ST1	61	44
R24	South Hetton (Windermere Road) Residential	LT1	43	34
R25	South Hetton East Residential	LT1	43	34
R26	South Hetton South East Residential	LT1	43	34
R27	South Hetton Welfare Park	LT1	43	34
R28	South Hetton Independent Methodist Church	ST10	51	38
R29	South Hetton (Clarence Gate) Residential	ST10	51	38
R30	Jade Business Park Phase 1 Units 4 to 7	LT1	43	34
R31	Jade Business Park Phase 1 Units 1 to 3	LT1	43	34
R32	Murton South Residential	LT2	47	38
R33	Hesledon Moor South Residential	LT2	47	38
R34	Hesledon Moor Central Residential	LT2	47	38
R35	Hesledon Moor North Residential	LT2	47	38
R36	Cold Hesledon Industrial Estate South	ST3	59	43

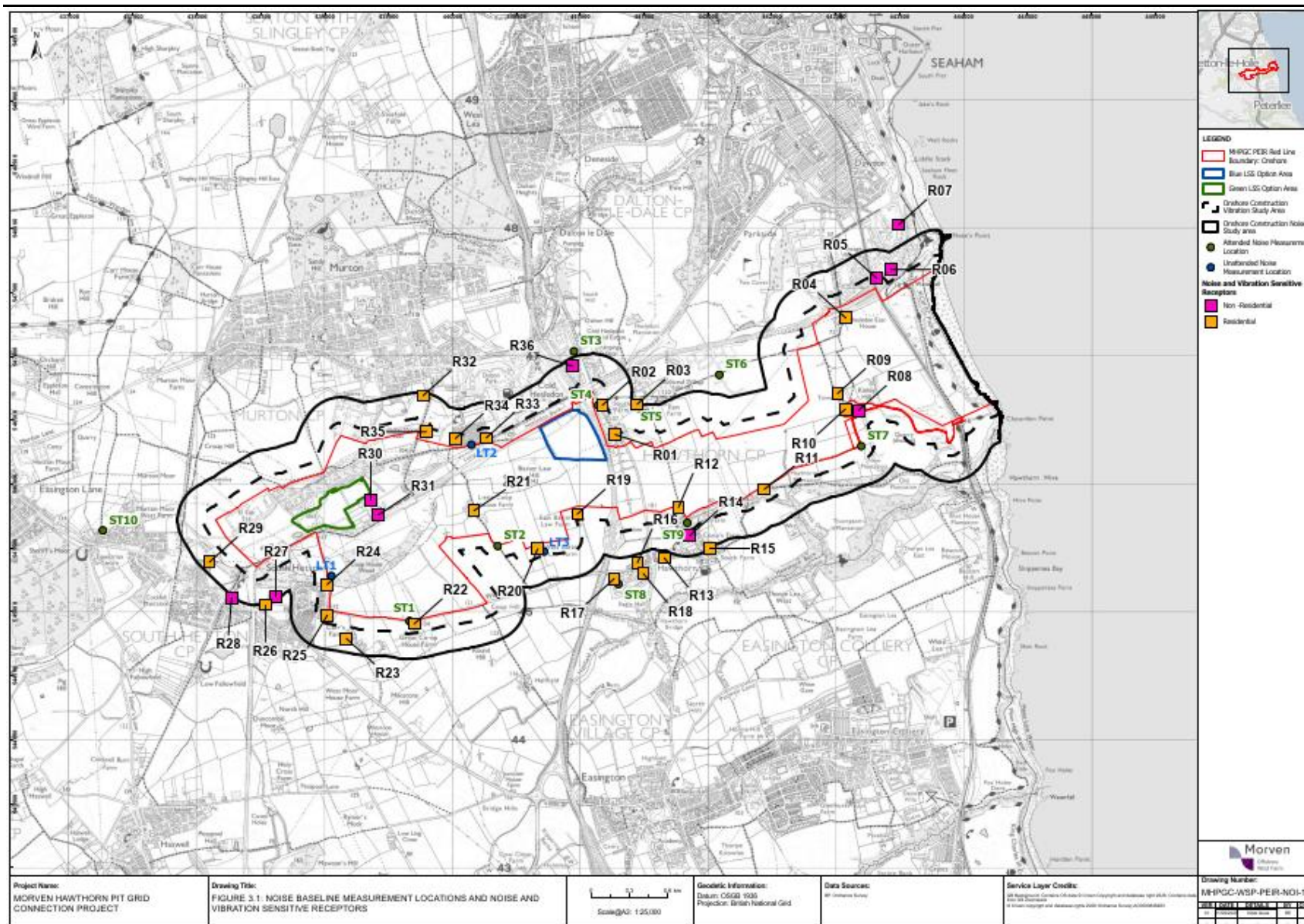


Figure 3.1: Noise baseline locations

3.3 Baseline vibration levels

- 3.3.1.1 Measurement of baseline vibration levels at sensitive receptors within the Onshore Noise and Vibration Study Areas has not been undertaken. The construction vibration assessment methodology within **Section 6.5 of Volume 3, Chapter 6: Noise and Vibration of the PEIR** considers absolute vibration levels associated with the MHPGC Project only. This approach has been agreed with stakeholders as set out within Section 6.3.2 of **Volume 3, Chapter 6: Noise and Vibration of the PEIR**.
- 3.3.1.2 Whilst baseline vibration levels at receptors have not been quantified, taking account of the rural location, they are not expected to be significant within the Construction Noise and Vibration Study Areas.

4 Assessment

4.1 Construction noise

4.1.1 Construction noise limits

- 4.1.1.1 BS 5228-1 ABC method provides guidance on setting thresholds for residential receptors, whereby construction noise exceeding these thresholds would result in potentially significant effects. Based on the measured ambient noise levels, thresholds can be determined for each location for daytime and night-time.
- 4.1.1.2 In accordance with the BS 5228-1 ABC Method and the assessment criteria presented in **Table 1.1**, the construction noise threshold for the residential receptors are shown in **Table 4.2**. For the majority of the residential receptors within the Construction Noise Study Area the measured noise levels indicate that, the construction noise threshold is typically Category A. However, there are residential receptors where the construction noise threshold of Category B or Category C would apply.

4.1.2 Construction noise threshold distances

- 4.1.2.1 **Table 4.1** presents indicative distances within which the construction noise thresholds may be exceeded during daytime, evening and night-time periods of construction for the key construction activities. A 5dB correction has been applied to the source noise levels for each activity based on the assumption that noise shall be controlled through the application of best practice measures.
- 4.1.2.2 The distance between the residential receptors within the Onshore Construction Noise Study Area and relevant construction activities have been compared with the indicative distances presented in **Table 4.1**. In the absence of receptor specific predictions the range in magnitude of impact which may be experienced has been reported. Where the residential receptors are located within the indicative threshold distance for their respective ABC Category, there is the potential for a medium to high impact magnitude to be experienced, i.e. an effect ranging between Moderate to Major adverse significance which is significant in EIA terms. In turn, if the residential receptor is located outside of the indicative threshold distances there is the potential for a Negligible to Low impact magnitude to be experienced, i.e. an effect ranging between Minor to Moderate adverse significance which is not significant in EIA terms.
- 4.1.2.3 The residential receptors where potential significant effects may be experienced in relation to construction activities associated with the construction landfall, onshore export and AC connection cable and LSS sites, i.e. where an impact magnitude of medium to high, are set out within **Table 4.2**.

Table 4.1: Construction noise threshold distances within which the ABC construction noise thresholds may be exceeded

Activity	Distance (m) within which Category A Thresholds may be exceeded			Distance (m) within which Category B Thresholds may be exceeded			Distance (m) within which Category C Thresholds may be exceeded		
	Day 5dB (A)	Evening 5dB (A)	Night- 5dB (A)	Day 0dB (A)	Evening 60dB (A)	Night- 0dB (A)	Day 5dB (A)	Evening 5dB (A)	Night 5dB (A)-
Haul road construction	106	n/a	n/a	60	n/a	n/a	34	n/a	n/a
Compound construction	76	n/a	n/a	43	n/a	n/a	24	n/a	n/a
Compound operation	11	n/a	n/a	6	n/a	n/a	4	n/a	n/a
Trenchless technique cable installation	116	365	1155	65	205	650	37	116	365
Open cut trenching	52	n/a	n/a	29	n/a	n/a	16	n/a	n/a
LSS construction	65	n/a	n/a	37	n/a	n/a	21	n/a	n/a
n/a: Activities are not proposed during these periods.									

Table 4.2: Summary of magnitude of construction noise impacts where there are potential exceedances in the ABC noise thresholds due to key construction activities

ID	Receptor Name	Approximate distance to the Activity (at closest point)	ABC Category			Activity								
						Haul road construction	Compound construction	Compound operation	Trenchless technique cable installation – Day	Trenchless technique cable installation –	Trenchless technique cable installation – Night	Open cut trenching	LSS construction	
Landfall														
R04	Hillcroft Residential	10 / 405 trenchless technique cable installation	A	A	A	Medium to High	Medium to High	Medium to High	Negligible - Low	Negligible – Low	Medium to High	n/a	n/a	
Onshore export / AC connection cable														
R01	Cold Hesledon South Residential	140	C	C	C	Negligible - Low	Negligible - Low	Negligible - Low	Negligible – Low	Medium to High	Medium to High	Negligible - Low	n/a	
R02	Cold Helsedon North Residential	75	C	C	C	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a	
R03	Cold Hesledon East Residential	295	A	A	A	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a	
R04	Hillcroft Residential	10	A	A	A	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	n/a	
R09	Kinley Hill Tower	10	A	A	A	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	n/a	
R10	Kinley Hill Farm Residential	10	A	A	A	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	n/a	
R11	Hawthorn Dene Residential	10	A	A	A	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	n/a	
R12	Hawthorn North Residential	10	A	A	A	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	n/a	
R13	Hawthorn Central Residential	330	A	A	A	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a	
R15	Hawthorn South East Residential	20	A	A	A	Medium to High	Medium to High	Negligible - Low	Medium to High	Medium to High	Medium to High	Medium to High	n/a	

ID	Receptor Name	Approximate distance to the Activity (at closest point)	ABC Category			Activity							
						Haul road construction	Compound construction	Compound operation	Trenchless technique cable installation – Day	Trenchless technique cable installation –	Trenchless technique cable installation – Night	Open cut trenching	LSS construction
R16	Hawthorn North West Residential	220	A	A	B	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a
R17	Hawthorn West Residential	415	A	A	B	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Negligible – Low	Medium to High	Negligible - Low	n/a
R18	Hawthorn South West Residential	430	A	A	B	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Negligible - Low	n/a
R21	Little Coop House Farm Residential	10	A	A	A	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	n/a
R22	Great Co-op House Farm Residential	55	A	A	B	Medium to High	Medium to High	Negligible - Low	Medium to High	Medium to High	Medium to High	Negligible - Low	n/a
R23	Carr's Farm Residential	120	A	A	B	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a
R24	South Hetton (Windermere Road) Residential	10	A	A	A	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	n/a
R25	South Hetton East Residential	30	A	A	A	Medium to High	Medium to High	Negligible - Low	Medium to High	Medium to High	Medium to High	Medium to High	n/a
R26	South Hetton South East Residential	290	A	A	A	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a
R29	South Hetton (Clarence Gate) Residential	230	A	A	A	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a
R32	Murton South Residential	250	A	A	A	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a
R33	Hesledon Moor South Residential	10	A	A	A	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	Medium to High	n/a
R34	Hesledon Moor Central Residential	15	A	A	A	Medium to High	Medium to High	Negligible - Low	Medium to High	Medium to High	Medium to High	Medium to High	n/a

ID	Receptor Name	Approximate distance to the Activity (at closest point)	ABC Category			Activity							
						Haul road construction	Compound construction	Compound operation	Trenchless technique cable installation – Day	Trenchless technique cable installation –	Trenchless technique cable installation – Night	Open cut trenching	LSS construction
R35	Hesledon Moor North Residential	140	A	A	A	Negligible - Low	Negligible - Low	Negligible - Low	Negligible - Low	Medium to High	Medium to High	Negligible - Low	n/a
Blue Option LSS Area													
R01	Cold Hesledon South Residential	140	C	C	C	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Negligible - Low
R02	Cold Helsedon North Residential	75	C	C	C	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Negligible - Low
n/a: Activity will not be carried out within 300m of the identified residential receptor, i.e. are outside of the study area for the construction noise assessment.													

4.2 Construction vibration

4.2.1.1 **Table 4.3** presents the distances at which vibration levels are predicted to meet the criteria thresholds.

Table 4.3: Predicted ground-borne vibration levels

Vibration generating activity	PPV (mm/s)	Minimum distance between receptor and works (m) before PPV (mm/s) exceeded
Vibratory rollers - start and end ⁽¹⁾	0.3	80
	1.0	30
Vibratory rollers - steady state ⁽¹⁾	0.3	60
	1.0	25
HGV Movement ⁽²⁾	0.3	7
	1.0	2
Excavation	0.3	9
	1.0	3

⁽¹⁾ Assumes two rollers, 0.5mm amplitude, drum width of 1.3m, for example, heavy-duty ride on roller.
⁽²⁾ Assumes PPV of 1mm/s at 2m, referenced within TRL Report 53.

4.2.1.2 The data presented in **Table 4.3** is based on construction vibration predictions carried in accordance with empirical formulae in BS 5228-2 and therefore are general in nature and are not site specific. In addition, different vibration generating activities may be employed other than those listed.

4.2.1.3 The results of the assessment indicate that ground-borne vibration may be just perceptible within residential properties (defined as PPV <0.3mm/s) when vibration-generating construction activities occur within 80m of the nearest residential receptors. For activities occurring beyond 80m from nearest receptors, vibration levels are predicted to remain below perceptibility thresholds (i.e., <0.3mm/s). However, when vibratory rollers are operated within 30m of a sensitive receptor, vibration levels may exceed 1.0mm/s PPV, which has the potential to give rise to complaints in accordance with the guidance set out in BS 5228-2.

4.2.1.4 The residential sensitive receptors presented in **Table 4.4** are those closest to the construction stage activities involving vibratory rollers and have the greatest potential to be subject to significant effects:

Table 4.4: Predicted ground-borne vibration levels

ID	Receptor Name	Approximate distance to the Activity (at closest point)	Magnitude of Impact
R02	Cold Helsedon North Residential	75	Low
R04	Hillcroft Residential	10	Medium
R09	Kinley Hill Tower	10	Medium
R10	Kinley Hill Farm Residential	10	Medium
R11	Hawthorn Dene Residential	10	Medium
R15	Hawthorn South East Residential	20	Medium
R19	East Batter Law Farm Residential	10	Medium

ID	Receptor Name	Approximate distance to the Activity (at closest point)	Magnitude of Impact
R20	West Batter Law Farm Residential	10	Medium
R21	Little Coop House Farm Residential	10	Medium
R22	Great Coop House Farm Residential	55	Low
R24	South Hetton (Windermere Road) Residential	10	Medium
R25	South Hetton East Residential	10	Medium
R33	Hesledon Moor South Residential	10	Medium
R34	Hesledon Moor Central Residential	15	Medium

4.3 Construction Road Traffic

- 4.3.1.1 The MHPGC Project traffic data (Average Annual Weekday Traffic (AAWT), percentage Heavy Goods Vehicles (HGV), and average speed) for input into the assessment is reported in **Table 4.5**. Where no data was available, this has been indicated as N/A in **Table 4.5**. The road links considered in the assessment are presented in **Figure 4.1**. Further details on the Transport Assessment are presented in **Volume 3, Chapter 5: Traffic and Transport, of the PEIR**.
- 4.3.1.2 The inputs from **Table 4.5** have been used to determine BNLs in the baseline (without Project) and construction (baseline plus Project) scenarios. The BNLs and differences between the two scenarios are reported in **Table 4.6**. Where the AAWT flow is below the level where the BNL can reliably be predicted (i.e. an AAWT of 1000) "N/A" has been reported in the table. For these road links, the BNL for Scenario 2 has been calculated using the Noise Advisory Council Method.
- 4.3.1.3 For the Blue Onshore LSS Option (Scenario 2), the results in **Table 4.6** show the access road links to Jade Business Park experience the highest noise level changes which, during peak construction, range between +2.2dB and +3.5dB. For the Green Onshore LSS Option (Scenario 3), the results in **Table 4.6** show the access road links to Jade Business Park experience noise level changes, during peak construction, ranging between +2.4dB and +3.7dB. There are no residential properties within 50m of the access road links.
- 4.3.1.4 In both the Blue Onshore LSS Option (Scenario 2) and the Green Onshore LSS Option (Scenario 3), the results in **Table 4.6** show on the remaining road links the noise level changes during peak construction, range between +0.0dB and +0.7dB, i.e. an impact magnitude of Negligible.



Table 4.5: Summary of traffic data used as a basis for the construction stage traffic assessment

Road link ID	Road link name and location	Scenario 1: Baseline		Scenario 2 Blue LSS Option		Scenario 3 Green LSS Option		Average speed (km/hr)
		AAWT 18 hr	% HGV	AAWT 18 hr	% HGV	AAWT 18 hr	% HGV	
E1	A19: from Seaton Lane to B1285	65901	5.66%	73322	5.89%	73349	5.90%	70
E2	A182: from A19 roundabouts to compounds	10674	5.45%	12351	6.01%	12356	6.01%	60
E3	West Lane	814	0.27%	887	0.27%	887	0.27%	60
E4	B1287 into Seaham	n/a	n/a	n/a	n/a	n/a	n/a	60
E5	A19 from Burdon Lane to Seaton Lane	60672	6.86%	67478	7.11%	67502	7.12%	70
E6	A19 from A182 to Hall Walks	96526	6.86%	107100	7.01%	107123	7.02%	70
E7	A19 from Hall Walks to the south	71709	6.85%	79670	7.05%	79692	7.07%	70
A1	St. Benedict's Way (West)	6307	13.44%	6870	13.44%	6870	13.44%	30
A2	Stockton Road (North)	9816	12.58%	10756	12.50%	10760	12.50%	28
A3	A1018 (East)	10823	16.19%	11879	16.05%	11834	16.11%	38
A4	A1018 Stockton Road from St Benedict's Way roundabout to B1285 roundabout	19798	15.68%	21602	15.63%	21606	15.63%	43
A5	A1018 Stockton Road from A19 to B1285 roundabout (combined)	15359	22.00%	17041	21.92%	17045	21.91%	49
A6	B1285 Stockton Road from roundabout to Lord Byron's Walk	6566	12.11%	7152	12.11%	7152	12.11%	36
A7	B1404 Seaton Lane E of A19 slips	11089	13.00%	12078	13.00%	12078	13.00%	29
A8	B1404 Seaton Lane W of A19 slips	5395	13.44%	5876	13.44%	5876	13.44%	31

Road link ID	Road link name and location	Scenario 1: Baseline		Scenario 2 Blue LSS Option		Scenario 3 Green LSS Option		Average speed (km/hr)
		AAWT 18 hr	% HGV	AAWT 18 hr	% HGV	AAWT 18 hr	% HGV	
A9	B1285 Westlea Road from Lord Byron's Walk to Graham Way roundabout	9486	13.03%	10478	12.85%	10487	12.84%	27
A10	B1285 Church Street - A19 jct to Briar Glen	15844	10.57%	17338	10.53%	17343	10.52%	36
A11	B1432 Stockton Road from A182/B1285 junction to West Lane	5746	14.00%	6666	14.47%	6600	14.61%	45
A12	B1285 Church Street - Briar Glen west	6850	13.25%	7565	13.07%	7491	13.20%	43
A13	A182 from West Lane to the northwest	9659	17.72%	10508	17.72%	10508	17.72%	31
A14	A182: from West Lane to Salter's Lane	7661	16.87%	8334	16.87%	8334	16.87%	31
A15	Salters Lane	3284	20.24%	3577	20.24%	3577	20.24%	41
A16	A182 from West Lane to A19 / Durham Road roundabout	5857	18.35%	6372	18.35%	6372	18.35%	51
A17	Durham Road	3962	20.34%	4315	20.34%	4315	20.34%	46
A18	Hall Walks / Rosemary Lane	7486	14.64%	8153	14.64%	8153	14.64%	28
A19	B1285 Stockton Road from Halls Walk to A19	1467	16.06%	1598	16.06%	1598	16.06%	29
A20 / WSP 2	Access Road from A182 to Jade Business Park	1056	4.92%	1702	15.68%	1836	15.61%	24
X**	A182: from compound 1 to the east	10205	4.89%	11182	4.86%	11187	4.86%	60
WSP 1	Jade Access Road 1	616	2.76%	946	13.08%	1013	13.19%	27
WSP 2	Jade Access Road 2	1056	4.92%	1419	11.37%	1486	11.52%	24
WSP 3	B1285 from B1285 Church Street to A182	16321	7.29%	18100	7.85%	18121	7.86%	35
WSP 4	A19 Slip	4730	5.22%	5396	6.76%	5410	6.84%	24

Table 4.6: Summary of traffic data used as a basis for the construction stage traffic assessment

Road link ID	Road link name and location	Scenario 1: BNL without development $L_{A10,18hr}$, dB	Scenario 2 Blue LSS Option: BNL with development $L_{A10,18hr}$, dB	Scenario 2 Green LSS Option: BNL with development $L_{A10,18hr}$, dB	Difference, dB	
					Scenario 2 – Scenario 1	Scenario 3 – Scenario 1
E1	A19: from Seaton Lane to B1285	82.4	82.4	82.4	0.0	0.0
E2	A182: from A19 roundabouts to compounds	73.2	73.4	73.4	0.2	0.2
E3	West Lane	63.3	63.3	63.3	0.0	0.0
E5	A19 from Burdon Lane to Seaton Lane	82.2	82.3	82.3	0.1	0.1
E6	A19 from A182 to Hall Walks	84.2	84.2	84.2	0.0	0.0
E7	A19 from Hall Walks to the south	82.9	83.0	83.0	0.1	0.1
A1	St. Benedict's Way (West)	68.3	68.3	68.3	0.0	0.0
A2	Stockton Road (North)	69.8	69.8	69.8	0.0	0.0
A3	A1018 (East)	72.0	72.0	72.0	0.0	0.0
A4	A1018 Stockton Road from St Benedict's Way roundabout to B1285 roundabout	75.1	75.1	75.1	0.0	0.0
A5	A1018 Stockton Road from A19 to B1285 roundabout (combined)	75.6	75.6	75.6	0.0	0.0
A6	B1285 Stockton Road from roundabout to Lord Byron's Walk	68.9	68.9	68.9	0.0	0.0
A7	B1404 Seaton Lane E of A19 slips	70.6	70.6	70.6	0.0	0.0
A8	B1404 Seaton Lane W of A19 slips	67.6	67.6	67.6	0.0	0.0

Road link ID	Road link name and location	Scenario 1: BNL without development $L_{A10,18hr}$, dB	Scenario 2 Blue LSS Option: BNL with development $L_{A10,18hr}$, dB	Scenario 2 Green LSS Option: BNL with development $L_{A10,18hr}$, dB	Difference, dB	
					Scenario 2 – Scenario 1	Scenario 3 – Scenario 1
A9	B1285 Westlea Road from Lord Byron's Walk to Graham Way roundabout	69.7	69.7	69.7	0.0	0.0
A10	B1285 Church Street - A19 jct to Briar Glen	72.4	72.4	72.4	0.0	0.0
A11	B1432 Stockton Road from A182/B1285 junction to West Lane	69.8	70.1	70.1	0.3	0.3
A12	B1285 Church Street - Briar Glen west	70.1	70.1	70.1	0.0	0.0
A13	A182 from West Lane to the northwest	70.9	70.9	70.9	0.0	0.0
A14	A182: from West Lane to Salter's Lane	69.8	69.8	69.8	0.0	0.0
A15	Salter's Lane	67.7	67.7	67.7	0.0	0.0
A16	A182 from West Lane to A19/Durham Road roundabout	71.2	71.2	71.2	0.0	0.0
A17	Durham Road	69.1	69.1	69.1	0.0	0.0
A18	Hall Walks/Rosemary Lane	69.1	69.1	69.1	0.0	0.0
A19	B1285 Stockton Road from Halls Walk to A19	63.2	63.2	63.2	0.0	0.0
A20 / WSP 2	Access Road from A182 to Jade Business Park	59.4	62.9	63.1	3.5	3.7
X**	A182: from compound 1 to the east	72.7	72.8	72.8	0.1	0.1
WSP 1	Jade Access Road 1	54.0	56.8	57.1	2.8	3.1
WSP 2	Jade Access Road 2	59.4	61.6	61.8	2.2	2.4

Road link ID	Road link name and location	Scenario 1: BNL without development $L_{A10,18hr}$, dB	Scenario 2 Blue LSS Option: BNL with development $L_{A10,18hr}$, dB	Scenario 2 Green LSS Option: BNL with development $L_{A10,18hr}$, dB	Difference, dB	
					Scenario 2 – Scenario 1	Scenario 3 – Scenario 1
WSP 3	B1285 from B1285 Church Street to A182	71.6	71.9	71.9	0.3	0.3
WSP 4	A19 Slip	64.4	65.1	65.1	0.7	0.7

5 Next steps

- 5.1.1.1 Additional baseline survey measurements will be undertaken, if required, once the locations of construction activities are further defined, with consideration also given to recreational and ecological receptors.
- 5.1.1.2 The assessment of construction noise and vibration impacts will also be refined once more detail on construction activities, such as equipment and locations is available. The assessment will consider potential impacts at the identified noise and vibration sensitive receptors for the Project (as set out in Table 6.9 of **Volume 3, Chapter 6: Onshore Noise and Vibration, of the PEIR**), along with ecological receptors where required.

6 References

British Standards Institution (2008). BS6472-1:2008 Guide to Human Exposure to Vibration in Buildings. London. BSI Standards Limited.

British Standards Institution (2009). BS5228-1:2009+A1:2019 Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 1: Noise. London. BSI Standards Limited.

British Standards Institution (2014). BS5228-2:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 2: Vibration'. London. BSI Standards Limited.

Department of Transport (1988). Calculation of Road Traffic Noise. London. HMSO.

National Highways (2020). Design Manual for Roads and Bridges (DMRB), LA 111, Noise and vibration, Revision 2. National Highways.

Noise Advisory Council (1967). A guide to Measurement and Prediction of the Equivalent Continuous Sound Level L_{eq} . Report by a Working Party for the Technical Sub-Committee of the Council.