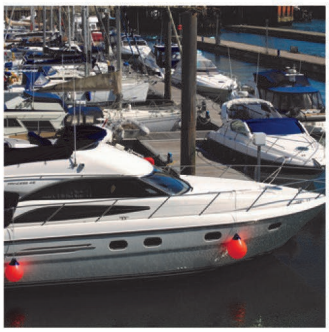
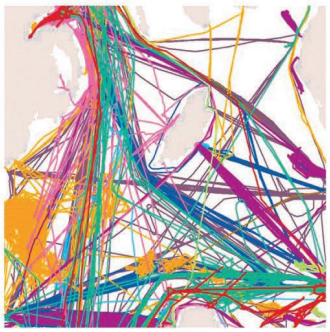
Associated British Ports

Immingham Eastern Ro-Ro Terminal

Preliminary Environmental Information
Chapter 14: Airborne Noise and Vibration

January 2022





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Document Information

Document History and Authorisation	
Title	Immingham Eastern Ro-Ro Terminal
	Preliminary Environmental Information Chapter 14: Airborne Noise and Vibration
Commissioned by	Associated British Ports
Issue date	January 2022
Document ref	R.3783
Project no	R/5035/1

Date	Version	Revision Details
14/01/2022	1	Issued for client use

Suggested Citation

ABPmer, (2022). Immingham Eastern Ro-Ro Terminal, Preliminary Environmental Information Chapter 14: Airborne Noise and Vibration, ABPmer Report No. R.3783. A report produced by ABPmer for Associated British Ports, January 2022.

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14.1 Introduction

14.1.1 This chapter, prepared by AECOM Ltd, provides a preliminary assessment of any potential significant effects of the proposed Immingham Eastern Ro-Ro Terminal (IERRT) on Noise Sensitive Receptors (NSRs) during construction and operation.

14.1.2 The site of the proposed IERRT is located within the operational Port of Immingham, which has been in active use for port purposes for a number of decades. The current use of the site is for bulk cargo, steel sections, lorry and automotive storage.

14.1.3 This chapter describes the methodology used to assess the effects of the project; the baseline conditions currently existing at the site and surrounding area; the measures identified to prevent, reduce or offset any identified significant negative effects; and the likely residual effects after these measures have been adopted.

14.1.4 The following NSRs have been considered as part of the assessment:

- Residential properties; and
- Other non-residential NSRs, including schools, hospitals, health centres and religious buildings.

14.1.5 The effects of airborne noise on waterbirds and underwater noise is considered in Chapter 9 Nature Conservation and Marine Ecology.

14.1.6 A number of figures support the description of the existing environment (baseline) and these are provided in Volume 2 of the Preliminary Environmental Information Report (PEIR).

14.1.7 Figure 14.1 shows the location of NSRs and noise monitoring locations in relation to the proposed IERRT.

14.1.8 Relevant aspects of the transport assessment have been used in this assessment for the calculation of changes in road traffic noise levels in the vicinity of the proposed development.

14.2 Definition of the study area

14.2.1 The study area for this assessment is the area over which potential direct and indirect effects of the IERRT project are predicted to occur during the construction and operational periods.

14.2.2 The spatial extent of the study area is defined by the locations of NSRs, namely residential dwellings on Queens Road and Kings Road, with the potential to be affected by the anticipated proposed development impacts.

For construction noise, the study area comprises NSRs within 300 m of the proposed development and for construction vibration, NSRs within 100 m of the proposed development. For operational noise, the study area comprises NSRs within 1 km of the proposed development. The study area also includes NSRs within 50 m of all roads with potentially significant increases in road traffic noise levels resulting from the proposed development.

14.2.3 The temporal extent of the assessment covers the anticipated construction phase (between 2023 and 2025), whilst the potential impacts associated with the operational phase are assessed during the opening year (2025) and a future year scenario (2032).

14.3 Assessment methodology

Assessment Scope

14.3.1 During construction, noise and vibration emissions have the potential to impact on sensitive receptors. Once operational, the main sources of noise associated with the project will be from site activities, including vessel movements, Heavy Goods Vehicle (HGV) movements around the site and mechanical plant associated with the proposed terminal buildings, and off-site road traffic movements on the existing highway network (Mainly HGVs travelling to and from the port). Operational site activities at the proposed development will be similar to the existing and surrounding land uses

Matters scoped in

14.3.2 This chapter provides a preliminary assessment of the changes likely to be generated by the IERRT, both beneficial and adverse during construction and operation.

14.3.3 The potential impact pathways during the construction phase are as follows:

- Potential noise and vibration impacts associated with construction activities on-site; and
- Potential noise impacts associated with traffic movements on local highways during construction.

14.3.4 The potential impact pathways during the operational phase are as follows:

- Potential noise impacts associated with traffic movements on local highways during operation; and
- Potential noise impacts associated with vessel movements, other site activities and mechanical plant.

14.3.5 Potential cumulative noise and vibration effects could arise as a result of other developments in the area, as well as existing activities at the site. These will be considered as part of the cumulative and in-combination assessment in Chapter 20.

Matters scoped out

14.3.6 The following pathways are proposed to be scoped out of the EIA:

- Vibration emissions from the construction and operation of the proposed development: the closest identified NSR is approximately 200 m on Queens Road from the proposed development. At this distance, vibration emissions from the construction and operation of the proposed development are likely to be imperceptible. Assessments of construction and operational vibration on residential NSRs are, therefore, scoped out of the EIA.

14.3.7 The scoping opinion (Table ID 4.9.1) response from the Planning Inspectorate (PINS) accepts that this distance is sufficient to avoid significant effects on human receptors.

14.3.8 The PEAR (Appendix 6.1) has identified the potential for noise disturbance to otter that may be using the ditch/ drain network in close proximity to (but outside) the proposed development. However, the appraisal concluded that given that the areas within the proposed development boundary are already in use for the storage of bulk materials and vehicles, and are within the operational port area, it is reasonable to assume that any otters using adjacent drains are habituated to noise associated with ongoing operational port usage in these areas. No other terrestrial ecology receptors that are sensitive to the effects of noise and vibration were identified within or adjacent to the proposed development. The assessment of noise and vibration impacts on terrestrial ecological receptors has, therefore, been scoped out.

Data and information sources

14.3.9 Current baseline conditions have been determined by a sound survey to characterise the sound climate, supplemented by a desk-based review of available information.

14.3.10 The main desk-based sources of information that have been reviewed to inform the current baseline description within the vicinity of the proposed development include:

- Satellite imagery;
- Ordnance Survey Mapping; and
- UK environmental noise mapping undertaken as per the requirements of the Environmental Noise Directive (END) Directive.

14.3.11 In order to define existing sound conditions at NSRs, ambient sound measurements have been undertaken at three representative residential NSRs (M1 to M3) located closest to the proposed development and potential highway/traffic routes:

- M1 Opposite 54 Kings Road, Immingham;
- M2 Opposite Queens Road Café, Queens Road, Immingham; and
- M3 Number 2, Humber Road, South Killingholme.

14.3.12 The following sources of information currently available have been reviewed and form the basis of the assessment of likely significant effects of noise and vibration as a result of the proposed development:

- Construction plant and equipment (provided by ABP from experience on similar sites);
- Construction noise data referenced in BS 5228 2009+A1:2014: 'Noise and Vibration Control on Construction and Open Sites – Part 1: Noise' (BSI, 2014a;
- Proposed site layout plans (see Figures 1.2 and 1.3); and
- Initial Annual Average Weekly Traffic (AAWT) data from the Transport Assessment (TA) for the proposed development.

Determining significance of effects

14.3.13 To facilitate the impact assessment process and ensure consistency in the terminology of significance, a standard assessment methodology has been applied. This methodology has been developed from a range of sources, including:

- The Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Noise Impact Assessment' (2014);
- Design Manual for Roads and Bridges LA111 Noise and vibration – Version 2 (Highways England, 2020);
- British Standard BS 5228:2009+A1:2014: 'Noise and Vibration Control on Construction and Open Sites – Part 1: Noise' (British Standards Institute (BSI), 2014a);
- BS 5228:2009+A1:2014: 'Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration' (BSI, 2014b);
- BS 4142:2014+A1:2019: 'Methods for rating and assessing industrial and commercial sound' (BSI, 2019);
- BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' (BSI, 2014c); and
- 'Calculation of Road Traffic Noise' (CRTN) (Department of Transport/ Welsh Office, 1998).

14.3.14 An understanding of the existing sound climate across the proposed development site and surroundings area has been developed through sound measurements at NSRs, traffic count data for the local highway network and a review of details of the historic use of the site together with topographical information. This baseline information is used to assess noise during construction (including piling operations), construction traffic, dredging, plant noise, and operational noise associated with the proposed development.

14.3.15 The Noise Policy Statement for England (NPSE) (Department for Environment, Food and Rural Affairs (Defra), 2010) sets out the long-term vision of the government's noise policy, which is to 'promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development'.

14.3.16 This long-term vision is supported by three aims as stated in NPSE paragraph 1.7 :

- *"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*
  - *Avoid significant adverse impacts on health and quality of life;*
  - *Mitigate and minimise adverse impacts on health and quality of life;*
  - *Where possible, contribute to the improvement of health and quality of life."*

14.3.17 The 'Explanatory Note' within the NPSE paragraphs 2.20 and 2.21 provides further guidance on defining 'significant adverse effects' and 'adverse effects' using the concepts:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to sound can be established;
- Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

14.3.18 In March 2014, the Department for Communities and Local Government (now Department for Levelling Up, Housing and Communities) released its Planning Practice Guidance (PPG) web-based resource (MHCLG, 2019) to support the NPPF.

14.3.19 PPG provides additional context when considering noise impacts with regards to LOAELs and SOAELs. This context is presented in Table 14.1.

14.3.20 The NPSE and PPG recognise that it is not possible to have single objective noise-based measures that define the SOAEL, LOAEL and NOEL that is applicable to all sources of noise in all situations. The levels are likely to be different for different sound sources, receptors and at different times of the day.

14.3.21 To determine appropriate LOAEL and SOAEL values in the context of the proposed development, reference has been made to methodologies and criteria presented in various British Standards and guidance documents. These documents are discussed in turn below.

Table 14.1. PPG guidance on the categorisation of noise impacts

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level (NOEL)			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level (NOAEL)			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude, or other physiological response e.g., turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the sound. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid

Response	Examples of Outcomes	Increasing Effect Level	Action
Present and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Source: MHCLG, 2019b

Construction Phase

Noise from construction activities

14.3.22 To determine the potential temporary noise and vibration impacts that may arise during the construction phase of the proposed development, the following matters have been considered:

- Noise and vibration caused by construction site activities; and
- Noise caused by increases in traffic on existing roads.

14.3.23 The potential noise and vibration impacts arising from construction site activities have been assessed in accordance with the methods and guidance in BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise' (BSI, 2014a).

14.3.24 The assessment involves the calculation of sound emissions from the construction site based on the sound power levels associated with the plant or equipment used, and propagation of sound from source to noise sensitive receptor locations. Sound power levels are taken from manufacturer provided data and/or archive data given in BS 5228 Part 1. These calculated levels are then compared to nominated criteria to determine whether adverse impact is expected.

14.3.25 The 'ABC' method (detailed in BS 5228 Part 1 Section E.3.2) has been used to develop criteria. Using this method, the construction noise limit for the proposed development can be determined by rounding the ambient noise level at receptor positions to the nearest 5 dB and then comparing this level to the Category A, B and C values given in BS 5228, detailed below in Table 14.2.

Table 14.2. Construction noise thresholds at residential dwellings

Assessment category and threshold value period	Threshold value $L_{Aeq,T}$ dB(A) – free-field		
	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 3 dB due to site noise. NOTE 3: Applies 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, 07:00 – 23:00 Sundays.			

Source: BSI, 2014a

14.3.26 For the appropriate period (day, evening, night, weekend etc.), the ambient noise level is determined and rounded to the nearest 5 dB and the appropriate threshold value is then derived. The predicted construction noise level is then compared with this noise threshold value.

14.3.27 Based upon the BS 5228 ABC method (BSI, 2014a), the criterion adopted in this assessment for the determination of potentially significant effects is the exceedance of the $L_{Aeq,T}$ threshold level for the category appropriate to the ambient noise level at each NSR. This is considered to be potentially equivalent to the SOAEL, although as stated in BS 5228, other project-specific factors, such as the number of NSR's affected and the duration and character of the impact, should also be considered by the assessor when determining if there is a potentially significant effect.

14.3.28 For residential receptors and other high sensitivity human receptors, the criterion for the LOAEL is a predicted construction noise level equal to the existing ambient noise level at each NSR i.e. resulting in a 3 dB increase in noise level when combined with the existing ambient noise level.

14.3.29 It is noted that the criteria for the LOAEL and SOAEL relate to residential NSR only, in line with the ABC method.

14.3.30 In accordance with the NPPF and NPSE, it is important to avoid significant adverse effects (at or above the SOAEL) and also mitigate and minimise or other adverse effects (above the LOAEL), where possible. This assessment focuses on the impact at existing residential NSR.

14.3.31 Based on the above, the magnitude of construction noise on residential receptors is classified in accordance with the criteria in Table 14.3.

Table 14.3. Construction noise magnitude of impact for residential receptors

Magnitude of impact	$L_{Aeq,T}$ dB
High	Exceedance of ABC Threshold Value (the SOAEL) by ≥+5 dB
Medium	Exceedance of ABC Threshold Value (the SOAEL) by up to +5 dB
Low	Equal to or below the ABC Threshold Value (the SOAEL) by up to -5 dB
Negligible	Below the ABC Threshold Value (the SOAEL) by ≥-5 dB

Noise from construction traffic on existing roads

14.3.32 The noise impacts of construction traffic along existing roads have been assessed with reference to the Highways England document Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration Revision 2 (LA 111) (Highways England, 2020).

14.3.33 The change in noise level for relevant links has then been predicted based on the CRTN (Department of Transport, 1998) Basic Noise Level (BNL) methodology.

14.3.34 Predictions have been undertaken for both "with" and "without" construction traffic scenarios for each road link in the construction traffic model, using preliminary 18-hour Annual Average Weekday Traffic (AAWT) traffic flows from the transport assessment (Chapter 17).

14.3.35 The criteria for the assessment of traffic noise changes arising from construction road traffic have been taken from Table 3.17 of LA 111 (Highways Agency, 2020) and are provided in Table 14.4 below.

Table 14.4. Magnitude of impact at noise sensitive receptors from construction traffic

Magnitude of impact	Change in traffic noise level $L_{A10,18h}$ dB
Major (high)	≥ 5
Moderate (medium)	3 to <5
Minor (low)	1 to <3
Negligible	<1

Source: Highways Agency, 2020

14.3.36 DMRB LA111 Table 3.49.1 defines the LOAEL as 55 dB $L_{A10,18h}$ and the SOAEL as 68 dB $L_{A10,18h}$. DMRB goes on to state in Table 3.60 that:

"Where any do-something absolute noise levels are above the SOAEL, a noise change in the short term of 1.0dB or over results in a likely significant effect".

14.3.37 This implies that receptors experiencing noise levels exceeding the SOAEL are more sensitive to smaller changes in noise than receptors experiencing

absolute noise levels below the SOAEL. As the BNL is calculated at 10 m from the roadside, the absolute noise level is not considered to be representative of that which nearby receptors may experience; however, it is appropriate for defining a change in noise level. Should an increase in noise of greater than 1 dB be identified from a road where the BNL exceeds the SOAEL, additional calculations will be undertaken to identify the absolute noise levels at nearby receptors and the likelihood of significant effects.

Operational Phase

Noise from the operation of the proposed development

14.3.38 Noise emissions from the operation of the IERRT will be predicted using spreadsheets or sound propagation modelling software, based on information on the operating conditions and the levels of noise generated by the mechanical plant associated with the terminal buildings and on-site activities. An initial assessment will be undertaken, by comparing the predicted operational noise levels against the ambient noise levels of the existing port operating 24 hours a day, 7 days a week and if likely significant impacts are predicted, more detailed assessment will be undertaken.

14.3.39 The IEMA 'Guidelines for Environmental Noise Impact Assessment' (2014) will be used to assess the impact of changes in ambient noise level at NSRs due to the operation of the proposed development. On the impact of noise level changes, paragraph 2.7 of the guidelines state –

> *"For broad band sounds which are very similar in all but magnitude, a change or difference in noise level of 1 dB is just perceptible under laboratory conditions, 3 dB is perceptible under most normal conditions, and a 10 dB increase generally appears to be twice as loud. These broad principles may not apply where the change in noise level is due to the introduction of a noise with different frequency and/or temporal characteristics compared to sounds making up the existing noise climate. In which case, changes of less than 1 dB may be perceptible under some circumstances."*

14.3.40 The IEMA Guidelines (2014) provide criteria for magnitude of impacts due to noise level changes from a project, as shown in Table 14.5.

Table 14.5. Categorising the magnitude of the basic noise change

Noise Change, dB	Impact
0	Negligible
0.1 to 2.9	Minor (low)
3 to 4.9	Moderate (medium)
5 to 9.9	Major (high)

Noise from road traffic during the operational phase of the proposed development

14.3.41 The noise from road traffic during the operational phase of the proposed development has been assessed using guidance provided in LA 111 (Highways England, 2020).

14.3.42 The change in noise level for relevant links has then been calculated based on the CRTN (DfT/Welsh Office, 1998) BNL methodology. The relevant links assessed in this PEIR chapter are along Queens Road, for proposed development traffic using the East Gate and along A160 for proposed development traffic using the West Gate.

14.3.43 Predictions have been undertaken for both "with" and "without" the proposed development using preliminary 18-hour AAWT and hourly traffic flows from the transport assessment (Chapter 17). Typically, traffic noise levels are assessed over an 18-hour period (06:00 to 00:00) based on 18-hour AAWT traffic flows. However, as the proposed development is operational 24 hours a day, hourly traffic data has also been considered.

14.3.44 The criteria for the assessment of traffic noise changes arising from the operational phase road traffic have been taken from Table 3.54 of LA 111 (Highways Agency, 2020) and are provided in Table 14.6 below.

Table 14.6. Magnitude of impact at noise sensitive receptors from operational phase traffic

Magnitude of impact	Short term change in traffic noise level $L_{A10,18h}$ dB
Major (high)	≥ 5
Moderate (medium)	3 to <4.9
Minor (low)	1 to <2.9
Negligible	<1
Magnitude of impact	**Long term change in traffic noise level $L_{A10,18h}$ dB**
Major (high)	≥ 10
Moderate (medium)	5 to <9.9
Minor (low)	3 to <4.9
Negligible	<3

Source: Highways Agency, 2020

14.3.45 At this preliminary stage of assessment, operational traffic movements are based on the proposed development operating at full capacity in the opening year – taken as a worst-case scenario. The operational traffic impacts presented in this PEIR have been assessed against the short term magnitude of impact in Table 14.6. For the Environmental Statement (ES), both the short term and long term operational road traffic noise impacts will be assessed and will take the context of the noise climate of an existing port in an industrial area into consideration when determining the final significance of effect.

14.3.46 As stated in paragraph 13.3.31 DMRB LA111 Table 3.49.1 defines the LOAEL as 55 dB $L_{A10,18h}$ and the SOAEL as 68 dB $L_{A10,18h}$. DRMB goes on to state in Table 3.60 that:

"Where any do-something absolute noise levels are above the SOAEL, a noise change in the short term of 1.0dB or over results in a likely significant effect".

Significance Criteria

14.3.47 Effects are classified based on the magnitude of the impact (as outlined above for the various potential impacts during construction and operation) and the sensitivity or value of the affected receptor. A scale of receptor sensitivity in presented in Table 14.7.

Table 14.7. Sensitivity / value of receptors

Sensitivity/ value of resource/receptor	Description	Example of receptor usage
Very high	Receptors where noise or vibration will significantly affect the function of a receptor	Auditoria/studios Specialist medical/teaching centres, or laboratories with highly sensitive equipment
High	Receptors where people or operations are particularly susceptible to noise or vibration	Residential Quiet outdoor areas used for recreation Conference facilities Schools/educational facilities in the daytime Hospitals/residential care homes Libraries
Medium	Receptors moderately sensitive to noise or vibration where it may cause some distraction or disturbance	Offices Restaurants/retail Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf)
Low	Receptors where distraction or disturbance of people from noise or vibration is minimal	Residences and other buildings not occupied during working hours Factories and working environments with existing high noise levels Sports grounds when spectator or noise is a normal part of the event
Very high	Receptors where noise or vibration will significantly affect the function of a receptor	Auditoria/studios Specialist medical/teaching centres, or laboratories with highly sensitive equipment

Classification of effects

14.3.48 Impacts are defined as changes arising from the proposed development, and consideration of the result of these impacts on environmental receptors enables the identification of associated effects, and their classification (major, moderate, minor and negligible, and adverse, neutral or beneficial). Each effect has been classified both before and after mitigation measures have been applied.

14.3.49 The following terminology has been used in the assessment to define effects:

- *adverse – detrimental or negative effects to an environmental resource or receptor;*
- *neutral – effects to an environmental resource or receptor that are neither adverse nor beneficial; or*
- *beneficial – advantageous or positive effect to an environmental resource or receptor.*

14.3.50 The effect resulting from each individual potential impact types above is classified according to the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix presented in Table 14.8 below, but where necessary also considering the context of the acoustic environment. The proposed development is located within one of the busiest ports in the UK, operating 24 hours a day, 365 days a year, and will replace existing port business currently operating on the development site.

Table 14.8. Classification of effects

Sensitivity/ value of resource / receptor	Magnitude of impact			
	High	Medium	Low	Negligible
Very high	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

14.3.51 Where adverse or beneficial effects have been identified, these have been assessed against the following significance scale, derived using the matrix presented in Table 14.8:

- negligible – imperceptible effect of no significant consequence;
- minor – slight, very short or highly localised effect of no significant consequence;
- moderate – limited effect (by extent, duration or magnitude), which may be considered significant; or
- major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

14.3.52 For the purposes of this assessment, negligible and minor effects are considered to be not significant, whereas moderate and major effects are considered to be significant. The context of the existing acoustic climate will also be taken into account when determining the overall significance.

14.4 Consultation

14.4.1 Consultation with regard to the outcomes of the formal scoping process, and whether there are likely noise and vibration effects arising from the IERRT project has been undertaken as appropriate with the Environmental Health Departments at North East Lincolnshire Council (NELC) and North Lincolnshire Council (NLC).

14.4.2 The results of the consultation that has been undertaken to date, along with the outcome of such consultation - as well as the comments received in the Scoping Opinion - and how they have together influenced the airborne noise and vibration assessment, are provided in Table 14.9.

Table 14.9. Summary of consultation to date

Consultee	Reference, Date	Summary of Response	How comments have been addressed in this chapter
Planning Inspectorate (PINS)	Scoping Opinion, October 2021 Table ID 4.9.1	The ES should include an assessment of vibration emissions during construction and operation on ecological receptors or information demonstrating agreement with the relevant consultation bodies and the absence of an Likely Significant Effect (LSE).	The potential impacts of airborne noise on waterbirds is assessed in Nature Conservation and Marine Ecology (Chapter 9). There is no evidence that vibration significantly effects these receptors, therefore vibration impacts have been scoped out. There are no identified sensitive terrestrial ecological receptors within the study area.
PINS	Scoping Opinion, October 2021 Table ID 4.9.2	The ES should explain how the final study area has been defined to reflect the zone of influence of the proposed development.	Information on the study area is provided in Section 14.2. This study area will be updated as necessary at the assessment stage to capture the envelope of likely significant effects

Consultee	Reference, Date	Summary of Response	How comments have been addressed in this chapter
PINS	Scoping Opinion, October 2021 Table ID 4.9.3	The ES should address effects from airborne noise and vibration on ecological receptors or provide a justification as to why LSE would not arise.	The potential impacts of airborne noise on waterbirds is assessed in Nature Conservation and Marine Ecology (Chapter 9). There is no evidence that vibration significantly effects these receptors, therefore vibration impacts have been scoped out. There are no identified sensitive terrestrial ecological receptors within the study area.
PINS	Scoping Opinion, October 2021 Table ID 4.9.4	The Applicant is advised to seek specific agreement with NELC's Environmental Health Department around the approach to collecting baseline data and the selection of receptors. The Applicant is advised to seek advice from NE and NELC on the ecological receptors which should be included in the assessment.	The Environmental Health Department at NELC and NLC have been consulted. Further information is provided in Section 14.5.
NELC Environmental Health Department	Email response from Vicky Thompson dated 29 October 2021	Confirmation that department is happy with the proposed methodology (as stated in scoping report) and the noise measurement locations.	NLC has been consulted and awaiting response. Further details are provided in Section 14.5.

Consultee	Reference, Date	Summary of Response	How comments have been addressed in this chapter
		Recommended to contact NLC Environmental Health Department regarding the noise monitoring location in South Killingholme	
NLC Environmental Health Department	Email to Karen Robinson, Environmental Protection Officer dated 2 November 2021	Awaiting response	Section 14.5

14.5 Implications of policy legislation and guidance

14.5.1 This section of the chapter sets out key aspects and implications of policy and guidance that are relevant to the assessment of likely impacts of noise and vibration on NSRs. It builds upon the overarching chapter covering Legislative and Consenting Framework (Chapter 5). This will be kept under review as the assessment progresses.

UK legislative and regulatory framework

Environmental Noise (England) Regulations 2006

14.5.2 The UK Government Environmental Noise (England) Regulations 2006 (as amended 2008, 2009, 2010) were introduced in England to implement European Union, Assessment and Management of Noise Directive 2002/49/EC (known as the END) (The European Parliament and Council of the European Union, 2002). The aims of the END are to define a common approach in order to avoid, prevent or reduce the harmful effects of environmental noise. Under the END, strategic noise mapping of major roads, railways, airports and agglomerations has been completed across England and Round 3 results were published in 2019.

Environmental Protection Act 1990

14.5.3 The Environmental Protection Act 1990 (EPA) Part 3 prescribes noise (and vibration) emitted from premises (including land) so as to be prejudicial to health or a nuisance as a statutory nuisance.

Control of Pollution Act 1974

14.5.4 Sections 60 and 61 of Control of Pollution Act 1974 (CoPA) provide the principal legislation regarding demolition and construction site noise and vibration. If noise complaints are received by the local planning authority

from local residents, a Section 60 notice may be issued by the local planning authority with instructions to cease work until specific conditions to reduce noise have been adopted.

14.5.5 Section 61 of the CoPA 1974 provides a means for applying for prior consent to carry out noise generating activities during construction. Once prior consent has been agreed under Section 61, a Section 60 notice cannot be served provided the agreed conditions are maintained on-site.

14.5.6 The CoPA requires that 'Best Practicable Means' (as defined in Section 72 of CoPA) be adopted for construction noise on any given site. CoPA makes reference to BS5228 as Best Practicable Means.

National policy

National Policy Statement for Ports (NPSfP)

14.5.7 The National Policy Statement for Ports (NPSfP) (DfT, 2012) states in paragraph 5.10.4 that the - "*the nature and extent of the noise assessment should be proportionate to the likely noise impact*". A staged approach to assessing the operational noise will, therefore, be undertaken, starting with a simple assessment of the predicted noise levels. If likely significant impacts are defined, further more detailed assessments will be undertaken.

14.5.8 NPSfP paragraph 5.10.9 also repeats the aims given in the NPSE discussed above at Section 14.3.

14.5.9 It provides at paragraph 5.10.12 that:

> *"Mitigation measures for the project should be proportionate and reasonable and may include one or more of the following:*
>
> - *engineering: reduction of noise at point of generation and containment of noise generated;*
> - *lay-out: adequate distance between source and noise-sensitive receptors; incorporating good design to minimise noise transmission through screening by natural barriers or other buildings;*
> - *administrative: limiting operating times of source; restricting activities allowed on the site; specifying acceptable noise limits; and taking into account seasonality of wildlife in nearby designated sites."*

National Planning Policy Framework (NPPF)

14.5.10 The National Planning Policy Framework (NPPF) (MHCLG, 2021a) sets out the Government's planning policies for England and how these are expected to be applied. The planning system is required to contribute to and enhance the natural and local environment. Consequently, the aim is to prevent both new and existing development from contributing to or being put at unacceptable risk from being adversely affected by unacceptable levels of noise pollution.

14.5.11 The NPPF states in paragraph 185 that planning policies and decisions should:

> *"Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life"; and*
> *"identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason".*

Noise Policy Statement for England (NPSE)

14.5.12 This document is discussed in Section 14.3 above.

Planning Practice Guidance on Noise (PPG-N)

14.5.13 This document is discussed in Section 14.3 above.

Local policy

North East Lincolnshire Local Development Plan 2013 to 2032 (adopted 2018)

14.5.14 The North East Lincolnshire Local Plan (LP) (2013 to 2032) was adopted in 2018 and sets out a strategic vision for the area. The plan is centred around set challenges for NELC and policy which has been implemented to solve them and support local economic sectors.

14.5.15 Paragraph 6.38 of the LP states:

> *"The Borough's economy is heavily reliant on good rail and road freight links, along with sea traffic. The LTP3 outlines a number of freight transport related issues, which have a direct bearing on the Borough's economic performance:*
> *1. local access to sites such as ports, affecting their day-to-day operations;*
> *2. transit routes that affect communities through high levels of HGV traffic and the severance, noise and pollution this can bring;*
> *3. access to main trunk routes, especially the motorway network;*
> *4. capacity constraints some distance from the area, such as constraints on the M1, A1 and East Coast Mainline; and,*
> *5. rail freight capacity in terms of train paths, line speeds and height restrictions."*

North Lincolnshire Local Plan

14.5.16 The North Lincolnshire Local Plan was adopted in 2003. The saved policies relevant to noise and proposed development include:

> *'DS1 – General Requirements*
> *A high standard of design is expected in all developments in both built-up areas and the countryside and proposals for poorly designed development will be refused. All proposals will be considered against the criteria set out below:…*

Amenity iii) No unacceptable loss of amenity to neighbouring land uses should result in terms of noise, smell, fumes, dust or other nuisance, or through the effects of overlooking or overshadowing.'

'DS11 - Polluting Activities Planning permission for development, including extensions to existing premises and changes of use, will only be permitted where it can be demonstrated that the levels of potentially polluting emissions, including effluent, leachates, smoke, fumes, gases, dust, steam, smell or noise do not pose a danger by way of toxic release; result in land contamination; pose a threat to current and future surface or underground water resources; or create adverse environmental conditions likely to affect nearby developments and adjacent areas'.

14.5.17 The local plan has been replaced by the Local Development Framework which includes a number of documents. The relevant noise policies are included below.

North Lincolnshire Council Planning for Health and Wellbeing-Supplementary Planning Document (November 2016)

14.5.18 The NLC Planning for Health and Wellbeing- Supplementary planning document was adopted in July 2016, it builds on policies in the Core Strategy and North Lincolnshire Local Plan, and sets out our planning policy towards Health and Wellbeing and is used to make decisions on planning applications.

14.5.19 Policy 3 – Well designed places states that when considering the detail of development, proposals should:

- *"Seek to reduce noise and air pollution through ensuring planning applications include a Noise Impact Assessment and Air Quality Assessment in areas of concern."*

14.5.20 Paragraph 4.15 states "*the design of places also needs to take account of transport which has a direct impact on health and safety. Air pollution, noise, traffic and congestion all have a negative impact on people's ability to enjoy their environment.*"

14.6 Preliminary description of the existing environment

14.6.1 The existing baseline sound climate at the Port of Immingham is dominated by port operations undertaken at one of the busiest ports in the UK on 24 hours, 7 day a week, 365 days year basis, together with the industrial/commercial premises on the north side of the A1173 and Immingham Lorry Park, as well as road traffic noise on the A1173 and local roads.

14.6.2 There are a limited number of NSRs in the vicinity of the site. There is a very small number of residential properties on Queens Road to the south of the port, approximately 200 m from nearest boundary of the proposed

development. There are existing commercial and industrial premises opposite the residential properties on Queens Road, which provide acoustic screening of the proposed development and will also provide an element of sound masking at times due to noise form their own operations.

14.6.3 There are some residential properties along Kings Road between Trenchard Close and Pelham Road, approximately 270 m south west of the nearest boundary of the proposed development. There are existing commercial and industrial premises opposite the residential properties on Kings Road which provide acoustic screening of the proposed development.

14.6.4 The village of South Killingholme is adjacent to the A160 and is north west of the proposed development. South Killingholme is over 3 km from the proposed scheme, however traffic from the proposed development may travel along the A160.

14.6.5 In order to help further define existing sound conditions at NSRs, ambient sound measurements have been undertaken at three representative residential locations (M1 to M3), closest to the proposed development and potential traffic routes, as listed below and shown on Figure 14.1 on 16 and 17 November 2021, namely -

- M1 - opposite 54 Kings Road, Immingham;
- M2 - opposite Queens Road Café, Queens Road, Immingham; and
- M3 - Number 2, Humber Road South Killingholme.

14.6.6 Sound monitoring was undertaken following the procedures set out in the CRTN (Department of Transport/Welsh Office, 1998) shortened measurement procedure and the requirements of BS 7445 1: 2003 'Description and measurement of environmental noise. Guide to quantities and procedures' (BSI, 2003), in particular regarding instrumentation and monitoring methodology. A minimum of three consecutive 1-hour attended measurements were completed at locations M1 and M3 between 10:00-17:00 on a typical weekday (avoiding school holidays, Bank holidays etc.) At location M2, a 1 hour measurement was undertaken during the day time period. During the night-time period (23:00 to 07:00) two 15 minute measurements were taken at all three locations. Each sound level meter was set to log the L_{AF10}, L_{Aeq}, L_{AF90} and L_{AFmax} parameters.

14.6.7 All measurements were taken at approximately 1.5 m above ground level, and were positioned at least 3.5 m from any reflecting surface, other than the ground (i.e. free-field). All measurements were attended and details of ongoing activities and noise sources in the area recorded.

14.6.8 The weather conditions during the survey periods were all within the parameters set out in the relevant guidance documents including BS 7445 (BSI, 2003) and CRTN (Department of Transport/Welsh Office, 1998). The weather conditions are summarised for each location in Appendix 14.1.

14.6.9 The sound level meters and associated microphones were field calibrated at the beginning and end of their respective measurement periods in accordance with recommended practice. No significant drift in calibration was observed. The accuracy of the calibrator can be traced to the National Physical Laboratory Standards. Full details of the equipment used can be found in Appendix 14.1.

14.6.10 Descriptions of noise sources heard on site at the measurement locations during the daytime are included in Table 14.10 and night-time noise sources are included in Table 14.11

Table 14.10. Noise description at the measurement location during the daytime survey period

Measurement Location	Date	Time of day	Noise Description
M1	17/11/2021	13:11-14:11	Dominated mainly by HGV traffic noise from Kings Road. Other sources comprised leaves rustling in the breeze, bird song and distant lorry horns.
M2	17/11/2021	12:41-15:41	Dominated by HGV traffic noise from Queens Road with minor contribution from a metal factory in the vicinity.
M3	16/11/2021	11:16-14:16	Dominated by road traffic noise from the A160, contribution from traffic noise with East Field Road junction, flaring from chimney to the north of the monitoring location and occasional aircraft overhead.

Table 14.11. Noise description at the measurement location during the night-time survey period

Measurement Location	Date	Time of day	Noise Description
M1	17/11/2021	03:15-03:45	Dominated mainly by HGV traffic noise from Kings Road and HGV activity behind the meter (loading/unloading). comprised leaves rustling in the breeze and distant industrial noise to the South West.
M2	17/11/2021	04:01-04:31	Dominated by a hum from a building to the North West, intermittent and irregular high frequency bursts. Contribution from traffic on Queens Road and distant traffic.

Measurement Location	Date	Time of day	Noise Description
M3	17/11/2021	02:20-02:50	Dominated by chimney flaring to the north of the monitoring location, minor contributions from distant industrial noises from the North West. Road traffic noise from A160.

14.6.11 A summary of the daytime sound levels can be found in Table 14.12.

Table 14.12. Daytime sound levels during survey periods

Measurement Location	Start Time	Duration	Measured sound levels				Calculated $L_{A10,18hr}$
			dB $L_{Aeq,T}$	dB $L_{AF90,T}$	dB $L_{AFmax,T}$	dB $L_{AF10,T}$	
M1	13:11	15 min	71	56	88	75	N/A
	13:26	15 min	71	55	88	75	
	13:42	15 min	72	57	93	75	
	13:57	15 min	72	52	92	75	
M2	12:41	1 hour	71	51	87	75	74
	13:41	1 hour	71	53	86	75	
	14:41	1 hour	70	52	86	74	
M3	11:16	1 hour	70	56	88	75	73
	12:16	1 hour	70	57	93	74	
	13:16	1 hour	70	58	88	75	
All values are in A-weighted dB re 20 µPa, Free-field							

14.6.12 A summary of the night-time sound levels can be found in Table 14.13.

Table 14.13. Night-time sound levels during survey periods

Measurement Location	Start Time	Duration	Measured sound levels			
			dB $L_{Aeq,T}$	dB $L_{AF90,T}$	dB $L_{AFmax,T}$	dB $L_{AF10,T}$
M1	03:15	15 min	63	43	86	60
	03:30	15 min	64	44	84	63
M2	04:01	15 min	56	47	76	51
	04:16	15 min	64	48	85	61
M3	02:20	15 min	65	53	85	66
	02:20	15 min	63	50	83	63
All values are in A-weighted dB re 20 µPa, Free-field						

14.7 Future baseline environment

14.7.1 The site of the proposed development forms part of the operational Port of Immingham and has been in active use for port purposes for many decades. The current use of the site is for bulk cargo, steel sections, lorry and automotive storage. In the absence of the IERRT, the site would continue to be utilised for port activity.

14.7.2 Future baseline sound levels at the NSR will depend largely on traffic flows on surrounding road/ rail networks and the future operations at other industrial and commercial premises. The future Do-Minimum traffic flows will be reviewed when available from the transport assessment.

14.8 Preliminary Consideration of Likely Impacts and Effects

14.8.1 This section identifies the potential likely effects on NSRs as a result of the construction and subsequent operation of the IERRT project, which have been identified at this preliminary stage.

14.8.2 At this stage of writing the PEIR, the initial information on proposed construction plant and operational noise data from similar Ro-Ro schemes have been reviewed. Predictions of construction and operational noise will be undertaken in the ES when more construction and operational data are available. Therefore, the preliminary qualitative assessment reported in this chapter is made based on professional judgement using the information available.

14.8.3 Preliminary construction and operational traffic data has, however, been provided, as referenced in Chapter 17 Traffic and Transport.

14.8.4 As stated in Section 14.6, there are a limited number of NSRs in the vicinity of the proposed development, with the nearest being residential properties on Queens Road (approximately 200 m south of the southern boundary of the proposed development) and Kings Road (approximately 270 m north west of the western boundary of the proposed development).

14.8.5 As a number of potential traffic routes to the proposed development are still being considered, the residential properties in South Killingholme, located adjacent to the A160, are also considered as part of the preliminary traffic noise assessment.

14.8.6 The preliminary likely impacts on marine ecological receptors, namely waterbirds, is discussed in Chapter 9 Nature Conservation and Marine Ecology.

14.8.7 Cumulative impacts on NSRs that could arise as a result of other coastal and marine developments and activities in the Humber Estuary will be

considered as necessary as part of the cumulative impacts and in-combination effects assessment, the approach to which is explained further in Chapter 20 of this PEIR.

Construction phase

14.8.8 This section contains an assessment of the potential impacts on NSRs as a result of the construction phase of the IERRT project. The following impact pathways have been assessed:

- Potential noise and vibration impacts associated with construction activities on-site; and
- Potential noise impacts associated with traffic movements on local highways during construction.

Construction Noise

14.8.9 At this stage of concept design detailed construction information and programme is not yet available. However, the likely construction activities and the typical plant likely to be used during construction works have been considered.

14.8.10 The principal works of construction will comprise, for the marine works, piling and dredging. Typical plant will include.

- Pile hammer;
- Vibratory hammer;
- Back hoe dredger;
- Barge hopper;
- Crane barge including 350 T crawler crane;
- Crawler crane 150 T;
- Tug/multi cat; and
- Hatch Barge/Deck barge.

14.8.11 Dredging will be a 24/7 operation until complete and will take around 100 days (based on an initial construction schedule). Marine piling should take around 2.5 months. The piling will not be continuous over the 2.5 months.

14.8.12 The landside construction works will comprise an upgrade of the existing port area, including the demolition of existing buildings, land clearance, enabling works, the construction of terminal buildings and an internal bridge within the development site, road making and cargo storage areas. Typical plant will include:

- Dozers;
- Hydraulic excavators ;
- Dump trucks,
- Crushers;
- Screening plant;
- Rollers;

- Road pavers;
- Asphalt/concrete plant;
- Tractor trailers;
- Tippers;
- Concrete pumps;
- Peckers;
- Compressors;
- Pavement breakers;
- Cranes;
- Dewatering pump;
- Petrol hydraulic hand breakers; and
- Telehandlers.

14.8.13 It is envisaged that the construction works will start in Summer 2023 and will be largely completed by early to mid-2025. Where possible works will be undertaken within standard construction hours, 07:00 to 18:00 Monday to Friday and 08:00 to 12:00 on Saturdays.

14.8.14 The proposed construction plant and programme will be reviewed again during the Environmental Statement (ES) work and construction noise levels will be predicted at NSRs.

14.8.15 The noise levels generated by construction activities and experienced by nearby NSRs, such as residential properties, will depend upon a number of variables, the most important of which are:

- The noise generated by plant or equipment used on site, generally expressed as sound power levels (SWL);
- The periods of operation of the plant on the site, known as its 'on-time';
- The distance between the noise source and the receptor;
- The attenuation due to ground absorption, air absorption and barrier effects; and
- The existing noise environment and noise levels at the time of the works.

14.8.16 Construction noise levels are likely to vary during different construction phases, depending on the location of work sites and proximity to NSRs. The nearest residential NSRs to the proposed development are on Queens Road and Kings Road. Based on the current ambient noise levels at M1 (Kings Road) and M2 (Queens Road) in Tables 14.9 and 14.10 and the BS 5228 ABC category guidance in Table 14.2, the construction noise limits for NSRs in the vicinity of these monitoring locations are 75 dB $L_{Aeq,12hr}$ during the daytime and 55 dB $L_{Aeq,8hr}$ during the night-time. Provided these noise limits are not exceeded the construction noise levels will be below the SOAEL.

14.8.17 Based on the above, using professional judgement, due to the distance from the proposed development site and the acoustic screening/masking provided by the existing commercial premises between the site and NSRs, the marine construction works are unlikely to result in exceedance of the construction noise limits, and therefore are unlikely to be significant.

14.8.18 For landside construction works, there is the potential for short term temporary medium adverse impacts to arise at NSRs if significant construction works are undertaken at the closest approach within the proposed development site to the nearest NSRs. This could result in up to moderate adverse effects which are significant. However, this will be assessed further in the ES. The acoustic screening provided by existing commercial premises and the mitigation measures outlined in Section 14.9 would further assist in minimising construction noise impacts.

Construction Traffic.

14.8.19 At this stage, preliminary construction traffic data are available, as reported in Chapter 17 Traffic and Transport. It is estimated that, on average, there would be a total of 140 HGV movements per day over a 21 month construction programme, working 5.5 days per week. There may be days where the peaks in construction traffic due to variations in construction activity will be considerably higher (with other days much lower) and therefore as stated in Chapter 17, a worst case scenario of a total of 280 construction HGV movements per day has been assessed.

14.8.20 The BNL of traffic noise on Queens Road and the A160 have been calculated 'with' and 'without' the construction traffic, using 18-hour AAWT traffic data provided by the Transport Consultant from traffic models reported in Chapter 17. The difference between the 'with' and 'without' construction traffic BNL has been compared to the short term change in noise levels as shown in Table 14.4.

14.8.21 Based on the 18-hour AAWT flows, the additional construction traffic would result in a predicted increase in road traffic noise levels of 0.2 dB on the A160 and 1.0 dB on Queens Road. These magnitudes of noise change would be considered as negligible and minor respectively in the short term as detailed in Table 14.3. In the context of existing road traffic and other environmental noise at NSRs close to the road network to be used by construction traffic, it is considered based on the preliminary construction traffic data that significant adverse noise effects are unlikely at nearby NSRs.

14.8.22 The extent of the required traffic management is not currently known and therefore it has not been included in this assessment. However, once available in will be included in the Construction Environmental Management Plan (CEMP) and an assessment will be undertaken to consider the potential noise impacts due to the changes in traffic flows and identify if additional mitigation measures will be required.

Operational phase

14.8.23 This section contains an assessment of the potential impacts on NSRs as a result of the operational phase of the IERRT project. The following impact pathways have been assessed:

- Potential noise impacts associated with traffic movements on local highways during operation; and
- Potential noise impacts associated with vessel movements, other site activities and mechanical plant associated with the terminal buildings.

Operational Noise

14.8.24 The proposed development is designed to service the embarkation and disembarkation of principally commercial and automotive traffic, possibly with provision for a small number of passenger use during the quiet periods. The existing cargo storage areas within the port estate adjacent to the proposed four berth pier will be used to accommodate the throughput of the Ro-Ro cargo as it is either awaiting embarkation or awaiting pick-up after being disembarked. There will be a number of terminal buildings to provide appropriate facilities for lorry drivers and passengers. A small office, workshop and gatehouse may also be required.

14.8.25 It is anticipated, that when operating at its maximum capacity, the new facility will service four arrivals and departures per day (i.e. one per berth). The timings of the vessels' arrivals and departures are still subject to change, but the current understanding is the vessels will generally arrive around 07:00 after overnight crossing from Europe and depart around 19:00 for overnight sailing. During this time the vessels will remain at the berth connected to ship to shore power plug ins.

14.8.26 A noise assessment for a similar Ro-Ro operation has been reviewed. The assessment relates to The Control of Noise at Work Regulations for port operatives, but provides some information on typical noise levels of the Ro-Ro vessel. For the ES stage, the potential noise from vessels arriving/departing and unloading/loading will be assessed at the nearest NSRs, based (where possible) upon noise level measurements on the existing operational port.

14.8.27 The nearest residential NSRs are on Queens Road and Kings Road, approximately 1.6 km and 1.8 km from the berths. At this distance and due to acoustic screening from intervening existing commercial premises and existing high ambient noise levels at NSRs and the initial review of available operational vessel noise data, operational noise impacts from the Ro-Ro vessels are likely to result in no or negligible impacts at NSRs, which are classified as not significant. The potential effects on marine ecological receptors, including waterbirds is assessed in Chapter 9 Nature Conservation and Marine Ecology.

14.8.28 The potential noise impacts of vehicle movements on site and the use of the HGV/ trailer parks will be assessed for the ES, once typical daily movements around the site are confirmed. The location of refrigerated units will also be confirmed and assessed.

14.8.29 As stated above there are a limited number of NSRs in the vicinity of the port which are residential. The residential properties on Queens Road and

Kings Road are 200 m and 270 m respectively from the nearest boundary of the proposed development; these areas are proposed for HGV and trailer parking. As the use of the port is 24-hours, there is the potential for up to medium adverse impacts from landside operations closest to the NSRs on Queens Road and Kings Road, which is moderate adverse significance of effect. However, as with construction noise impacts, acoustic screening provided by the existing commercial and industrial premises opposite the residential NSRs on Queens Road and Kings Road will help to reduce the potential operational noise impacts from the proposed development. The likely significance of effect will be confirmed in the ES.

Operational Road Traffic

14.8.30 At this stage, preliminary development traffic data (based on Port of Immingham profile) is available, as reported in Chapter 17 Traffic and Transport. It is estimated that there would be 2,592 HGV movements per day. The traffic data assumes 85 % of the proposed development HGVs will use the port's East Gate and travel along Queens Road and the remaining 15 % of the proposed development HGVs will use the port's West Gate and travel along the A160.

14.8.31 Using the preliminary development traffic data, CRTN BNLs have been calculated for 1-hour and 18-hour time periods for both Queens Road and the A160 (to consider the impacts on residential NSRs in South Killingholme).

14.8.32 As a 'worst-case' this preliminary assessment assumes that the proposed development will be fully operational in the opening year.

14.8.33 The predicted change in BNLs between the 'with' and 'without' development scenarios have been compared to the short term change in noise level scale as shown in Table 14.6. Based on the preliminary traffic data, a likely moderate magnitude of impact is predicted due to increased 18-hour AAWT flows on Queens Road (up to 4.7 dB increase in road traffic noise) and a likely negligible magnitude of impact on the A160 (up to 0.2 dB increase in road traffic noise).

14.8.34 When considering hourly traffic flows, there is the potential for medium or high increase in noise levels to occur on Queens Road. This might indicate up to moderate or major (significant) adverse effects at nearby residential NSRs along Queens Road. However, this is based on a worst case scenario with the proposed development fully operational in the opening year. The traffic data will be updated and reassessed as part of the ES work and will also take the context of the existing port and industrial area into consideration when determining the final significance of effect. Mitigation measures are discussed in Section 14.9.

14.8.35 When considering the hourly flows on the A160, a negligible increase is predicted across the full 24 hour period, which would indicate negligible (not significant) adverse effects on nearby residential NSRs adjacent to A160.

14.9 Mitigation measures

Construction Noise

14.9.1 There are a range of standard mitigation measures that will be implemented on site as best practice to reduce the potential for perceptible change in noise level as a result of the works. The Contractor should follow the advice contained within BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open site' (BSI, 2014a). The following measures will also be implemented on site to reduce as far as practicable the potential environmental impacts associated with noise and vibration from construction activities:

- Where reasonably practicable, the contractor will use quieter working methods, the most suitable plant and, reasonable hours of working for noisy operations;
- Where possible, the items of plant will be located the furthest distance from the nearby NSRs and ecological receptors. Plant known to emit noise strongly in one direction will, when possible, be orientated so that the noise is directed away from noise-sensitive areas;
- Acoustic covers to engines will be kept closed when the engines are in use and idling.
- The quietest practicable plant and operations will be selected for each phase of work;
- Machines such as cranes that may be in intermittent use will be shut down between work periods or should be throttled down to a minimum. Machines will not be left running unnecessarily;
- Materials should be lowered whenever practicable and should not be dropped. Any chutes and skips will be lined with sound attenuating material to reduce impact noise;
- No employees, subcontractors and persons employed on the site will cause unnecessary noise from their activities e.g. excessive 'revving' of vehicle engines, shouting and general behaviour etc. No radios or other audio equipment will be allowed on site;
- When operating plant, the use of noise-control equipment such as jackets on pneumatic drills, acoustic covers on compressors, shrouds on piling rigs arid cranes will be implemented;
- All plant machinery permitted to site and used on site will be maintained to the appropriate standards. Checks for adequate lubrication to reduce squeaks and the tightening of loose nuts and bolts to minimise rattles will form part of a routine maintenance cycle;
- The use of any tannoy system on site to be used for emergency use only;
- Hoods on vehicles and machinery to be kept closed;
- Where required and achievable screening between the source and the receiver of noise emissions will be installed;
- All plant machinery will conform with relevant standards and directives on permitted noise emissions levels;

- The hoods and doors on compressors and cranes will be closed but also be tightly fitting and well-sealed - these doors will be checked on a regular basis;
- Electrically powered plant will be used over diesel power generators where possible and feasible;
- All pneumatic percussive tools will be provided with effective silencers / acoustic covers;
- Audible warning systems (including reversing alarms) will be switched to the minimum setting required by the Health and Safety Executive; and
- All contractor communication devices will be used at a minimum audible level.

Construction Traffic Noise

14.9.2 Although the preliminary traffic data indicates that significant effects are unlikely, it is recommended that a construction traffic management plan is included as part of the CEMP, which should present the road management procedures used to manage traffic movements within the works and on the local road network in the vicinity of the closest NSRs. Designated construction traffic routes will be used, which will avoid the use of the busiest roads and residential streets near the proposed development.

Operational Noise

14.9.3 The mitigation measures for operational noise will be considered once the impact assessment has been completed as part of the ES. The mitigation measures could include:

- Additional screening between the HGV/ trailer parks and NSRs;
- Use of electric hook ups for refrigerated trailers;
- Planning of on-site movements, to avoid reversing and multiple movements of trailers within the site and
- Noise limits for fixed plant on buildings.

Operational Road Traffic Noise

14.9.4 The initial assessment undertaken based upon preliminary traffic data has indicated the potential for adverse effects at residential NSRs along Queens Road due to additional HGV movements from the new facility once fully operational. Potential options to avoid significant adverse effects, and mitigate other adverse effects will therefore be reviewed as part of the ES process, and may involve the routing, at some times of the day, of HGVs via the West Gate onto the A160.

14.10 Limitations

14.10.1 Detailed information about the proposed construction plant and programme are not yet available and therefore the construction noise assessment has been qualitative based on likely construction plant and professional judgement.

14.10.2 Similarly, at this preliminary stage initial noise data from the proposed Ro-Ro vessels has been reviewed based on available sources. However further operational noise levels from Ro-Ro vessels and detailed information regarding trailer and HGV movements will be confirmed as part of the ES assessment, where possible based upon measurements at the existing port. Therefore, a qualitative assessment based on professional judgement has been undertaken.

14.10.3 Initial traffic noise assessment has been undertaken by calculating the BNL for the hourly and 18-hour AAWT flows for the baseline, and 'with' the construction and operational development flows. Low hourly flows on Queens Road (below 50 vehicles per hour) are outside the reliability of the BNL calculations but have still been used to provide an indication of potential change in noise level. The indicative BNL calculations assume that all roads have zero gradient and the road surfaces remain unchanged with the proposed development in operation.

14.11 Preliminary Conclusions on Residual Effects

14.11.1 A summary of the impact pathways that have been assessed, and the identified residual effects and level of confidence are presented in Table 14.14.

14.11.2 The noise effects from marine construction activities at the proposed development and construction traffic on local roads are considered unlikely to be significant at the nearest NSRs on Queens Road and Kings Road. With standard construction mitigation measures in place, there is the potential of minor adverse effects during the landside construction works near to the nearby NSRs on Queens Road and Kings Road, which is not significant.

14.11.3 The operation of the vessels and loading/unloading at the Ro-Ro berth are considered unlikely to result in a significant adverse noise effect, due to the distance to the NSRs, existing high ambient noise levels and acoustic screening provided by existing commercial premises between the NSRs and proposed pier. There is the potential from some minor/moderate adverse effects due to on-site HGV and trailer movements at the lorry parks closest to the NSRs. This will be assessed further in the ES.

14.11.4 Based on preliminary development traffic flows there is potential for moderate or major (significant) adverse effects on NSRs along Queens Road if the majority of the development traffic uses the port's East Gate.

14.11.5 Outline mitigation measures have been reported in Section 14.9 and they will be considered further in the ES once the final impact assessments have been completed.

Table 14.14. Summary of potential impact, mitigation measures and residual impacts

Receptor	Impact pathway	Impact significance	Mitigation measure	Residual Impact	Confidence
Construction Phase					
NSRs- Residential	Construction Noise-Marine works	Negligible (not significant)	Standard construction mitigation measures	Negligible (not significant)	Medium
NSRs- Residential	Construction Noise-Landside works	Potentially moderate adverse (significant)	Standard construction mitigation measures	Minor adverse/ negligible (not significant)	Medium
NSRs- Residential	Construction Traffic	Negligible/ minor adverse (not significant)	Standard construction traffic management plan	Negligible/ minor adverse, (not significant)	Medium
Operational Phase					
NSRs Residential	Vessel operation	Negligible (not significant)	None at this stage	Negligible (not significant)	Medium/High
NSRs Residential	On site movements/ Lorry Park	Up to moderate adverse (significant)	Additional screening, on site management of movements	Minor adverse (not significant)	Medium/High
NSRs Queens Road	Development traffic on local roads	Moderate or major adverse (significant)	Re-routing traffic via West gate and A160	Minor/ moderate adverse (not significant)	Low
NSRs A160	Development traffic on local roads	Negligible (not significant)	None	Negligible (not significant)	Low

14.12 References

British Standards Institute (BSI). (2014a). BS 5228:2009+A1:2014: Code of practice for noise and vibration control on construction and open site– Part 1: Noise'.

British Standards Institute (BSI). (2014b). BS 5228:2009+A1:2014: Code of practice for noise and vibration control on construction and open site – Part 2: Vibration'.

British Standards Institute (BSI). (2014c). BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'.

British Standards Institute (BSI). (2019). BS 4142:2014+A1:2019: 'Methods for rating and assessing industrial and commercial sound'.

British Standards Institute (BSI). (2013). BS 7445-1:2003: 'Description and measurement of environmental noise - Guide to quantities and procedures'.

Department for Environment, Food and Rural Affairs (Defra). (2010). Noise Policy Statement for England.

Department for Transport (DfT). (2012). National Policy Statement for Ports.

Department of Transport (DfT)/ Welsh Office. (1998). Calculation of Road Traffic Noise.

Highways England. (2020). Design Manual for Roads and Bridges LA111 Noise and vibration – Version 2.

Institute of Environmental Management and Assessment (IEMA). (2014). Guidelines for Environmental Noise Impact Assessment.

Ministry of Housing, Communities and Local Government (MHCLG). (2019). Planning Practice Guidance.

Ministry of Housing, Communities and Local Government (MHCLG). (2021). National Planning Policy Framework.

North East Lincolnshire Council. (2018). North East Lincolnshire Local Plan.

14.13 Abbreviations/Acronyms

Acronym	Definition
AAWT	Annual Average Weekday Traffic
ABP	Associated British Ports
BNL	Basic Noise Level
BS	British Standard
BSI	British Standards Institute
CoPA	Control of Pollution Act
CRTN	Calculation of Road Traffic Noise
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
END	Environmental Noise Directive
EPA	Environmental Protection Act
ES	Environmental Statement
EU	European Union
HGV	Heavy Goods Vehicle
HMSO	Her Majesty's Stationery Office
IEMA	Institute of Environmental Management and Assessment
IERRT	Immingham Eastern Ro-Ro Terminal
LOAEL	Lowest Observable Adverse Effect Level
LP	Local Plan
LSE	Likely Significant Effect
MHCLG	Ministry of Housing, Communities and Local Government
NELC	North East Lincolnshire Council
NLC	North Lincolnshire Council
NOAEL	No Observed Adverse Effect Level
NOEL	No Observed Effect Level
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
NPSfP	National Policy Statement for Ports
NRMM	Non Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Projects

NSR	Noise Sensitive Receptors
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PPG	Planning Practice Guidance
PPG-N	Planning Practice Guidance on Noise
SOAEL	Significant Observed Adverse Effect Level
SPL	Sound Pressure Levels
TA	Transport Assessment
UAEL	Unacceptable Adverse Effect Level
UK	United Kingdom

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

14.14 Glossary

Term	Definition
Baseline conditions	Existing conditions and past trends associated with the environment in which a proposed activity may take place
Cumulative effect	Additional or modified effects on receptors as a result of interactions between the individual impacts of the proposed development and/or the proposed development and other plans, projects, and ongoing activities
Topography	The arrangement of the natural and artificial physical features of an area

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