

OUTLINE CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

Appendix 6 Outline Noise and Vibration Management Plan

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 –
Regulations 8(1)(c)

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NOISE AND VIBRATION, AND ECOLOGICAL RECEPTOR MITIGATION REAC COMMITMENTS

1. INTRODUCTION

1.1. PROJECT OVERVIEW

- 1.1.1. This document has been prepared on behalf of Liverpool Bay CCS Limited ('the Applicant') and relates to an application ('the Application') for a Development Consent Order (DCO) that has been submitted to the Secretary of State (SoS) for Energy Security and Net Zero under Section 37 of the Planning Act 2008 ('the PA 2008'). The Application relates to the Carbon Dioxide (CO₂) pipeline which constitutes the DCO Proposed Development.
- 1.1.2. The DCO Proposed Development will form part of HyNet North West ('the Project'), which is a hydrogen supply and Carbon Capture and Storage ('CCS') Project. The goal of the Project is to reduce carbon dioxide (CO₂) emissions from industry, homes and transport and support economic growth in the North West of England and North Wales. The wider Project is based on the production of low carbon hydrogen from natural gas. It includes the development of a new hydrogen production plant, pipelines, and the creation of CCS infrastructure. CCS prevents CO₂ entering the atmosphere by capturing it, compressing it and transporting it for safe, permanent storage.
- 1.1.3. The DCO Proposed Development is a critical component of the Project which, by facilitating the transportation of carbon dioxide, enables the rest of the Project to be low carbon. The hydrogen production and CO₂ capture and storage elements of the Project do not form part of the DCO Proposed Development and will be delivered under separate consenting processes.
- 1.1.4. A full description of the DCO Proposed Development is detailed in **Chapter 3 – Description of the DCO Proposed Development** of the consolidated Environmental Statement (ES), submitted at Deadline 4 (**Document Reference: D.6.2.3**).

1.2. PURPOSE OF THE DOCUMENT

- 1.2.1. This Outline Noise and Vibration Management Plan (ONVMP) will act as a control plan which sets out indicative methods to avoid, minimise and mitigate likely environmental effects during the construction of the Proposed Development, as reported in the ES and **Register of Environmental Actions and Commitments (REAC) (Document Reference: D.6.5.1)** submitted with the DCO Application. It includes the minimum protocols to be followed in implementing these measures in accordance with environmental commitments during the design, pre-construction and construction stages.
- 1.2.2. The measures within this ONVMP will be developed further during Detailed Design and construction and will be included within the detailed Noise and vibration Management Plan (NVMP) in accordance with Requirement 5(2) of the draft DCO [**REP4-008**].

- 1.2.3. This ONVMP identifies the methods by which noise and vibration potentially sensitive receptors (NVSRs), including residential properties; hotels; heritage NVSRs and ecological areas will be protected during the construction stages of the DCO Proposed Development.
- 1.2.4. This ONVMP details the management and monitoring processes to be introduced across all works sites. Where required, this includes:
- integration of noise control measures into the preparation of all method statements for the works;
 - details and locations of all site hoardings, screens or bunds that will provide acoustic screening during construction;
 - procedures for the installation of noise insulation or provision of temporary re-housing and to ensure such measures are in place as early as reasonably practicable; and
 - noise and vibration monitoring protocols including monitoring locations, stages during construction at which monitoring will be undertaken, and methods of publishing the results.
- 1.2.5. This ONVMP provides further detail on the principles for noise and vibration management as outlined in the following documents contained within the Development Consent Order (DCO) application:
- Environmental Statement (ES, Volume II): **Chapter 15 Noise and Vibration (Document Reference: D.6.2.15)**
 - **Register of Environmental Actions and Commitments (REAC) (Document Reference: D.6.5.1)**
- 1.2.6. This ONVMP aims to assist in complying with the legislative framework provided in the **Chapter 15** of the **ES (Document Reference: D.6.2.15)**.

2. ROLES AND RESPONSIBILITIES

2.1.1. The ONVMP will be developed into a NVMP during Detailed Design and Construction stages of the project. The monitoring procedures, responsibilities and compliance actions will be updated as appropriate maintaining the principles set in this document.

2.1.2. The main roles and responsibilities specific to noise and vibration management are set out in **Table 2-1** along with description of roles where applicable.

Table 2-1: Roles and Responsibility Matrix

Roles and Specifications	Responsibilities
<p>Construction Contractor(s)</p> <ul style="list-style-type: none"> - Work Supervision - Health and Safety 	<p>The Construction Contractor(s) shall be responsible for providing suitable qualified staff required to ensure adherence to the procedures identified under the Detailed CEMP and NVMP. Construction Contractor(s) Implementation of good practice guidelines as required by the Construction Contractor(s)CEMP and NVMP. This will include managing operatives/ workers, their areas of work, plant items, etc.</p> <p>The Construction Contractor(s) will be responsible for the health and safety of the operatives/ workers on site. A health and safety officer (or equivalent title) shall be appointed Construction Contractor(s)responsible for outlining strategies to minimise occupational hazard via noise and vibration exposure.</p>
<p>Noise and Vibration Consultant</p>	<p>Noise and Vibration Consultant will be responsible for supporting the Construction Contractor(s) in updating the NVMP, liaising with the Local Authorities, preparing Section 61s (under the Control of Pollution Act 1974 (CoPA)) where relevant, noise monitoring and reporting, responding to complaints, Best Practicable Means (BPM) audits and any other</p>

Roles and Specifications	Responsibilities
	relevant activities identified under the NVMP.
Community Liaison Representative	The Applicant will nominate a Community Liaison Representative (or equivalent title) who will be a nominated competent contact for whom the contact details will be shared with local residents and other third parties within close proximity to the construction works, and will be displayed clearly at site compounds. The Community Liaison Representative will be responsible for engaging with any noise or vibration related matters raised by third parties. Responsibilities should be clearly stated in the NVMP. (REAC item D-NV-003 (document reference: D.6.5.1))

2.2. CONSTRUCTION PROGRAMME

- 2.2.1. A preliminary construction programme is included in **ES Chapter 3 – Description of the DCO Proposed Development [REP4-029]**. The Construction Contractor(s) will produce a detailed construction programme which will be used to inform the site-specific noise and vibration management requirements to be applied in the NVMP.
- 2.2.2. To reduce the construction programme, where possible, works will be planned as a series of concurrent work packages via multiple teams that will be working simultaneously along the DCO Proposed Development. A single work package will focus on a specific area or location, where the construction workers will carry out aspects of the main construction activities.

2.3. NOISE AND VIBRATION ASSESSMENT CRITERIA

- 2.3.1. The noise and vibration assessment criteria to be adopted in the NVMP will follow the steps described in paragraphs 15.5.26 to 15.5.30 in **Chapter 15** of the ES (**Document Reference: D.6.2.15**). The following items will be also included in the significance criteria:
- The noise thresholds will be the values for evening and weekends in Table 15.5 in **Chapter 15** of the ES (**Document Reference: D.6.2.15**) following the ‘ABC’ categories in BS 5228-1:2009+A1:2014. The noise thresholds will be 55 dB L_{Aeq} for Category A, 60 dB L_{Aeq} for Category B, and 65 dB L_{Aeq} for Category C. Specifically, for shut-down activities, within the hours

of 18:00-19:00 on Monday to Friday and 13:00-14:00 on Saturday, the 'ABC' categories applicable at noise-sensitive receptors will be defined using the baseline noise levels $L_{Aeq,T}$ measured for the evening period between 19:00-23:00. For start-up activities within the hours of 07:00-08:00 on Monday to Saturday, the 'ABC' categories applicable at noise-sensitive receptors will be defined using the baseline noise levels $L_{Aeq,T}$ measured between 07:00-07:15. Noise measurements undertaken as part of the ES submitted with the DCO shall be used for this purpose unless the local noise climate has changed substantially; and

- Construction noise criteria for re-housing as described later in this document.

2.3.2. Mitigation measures described in Section 4 of this ONVMP will be followed to comply with the significance criteria above. Where necessary, Section 61 consent applications shall include the information required in Section 4.5 of this ONVMP.

3. LOCAL SENSITIVE RECEPTORS

3.1.1. This section provides a summary of the local sensitive receptors that may be impacted upon by noise and vibration during the construction stage.

3.1.2. The following noise sensitive receptors have been assessed during the construction stage and are displayed in Table 3-1. The table shows the number of sensitive receptors in each of the sections as defined in **Chapter 3 Description of the DCO Proposed Development, (Document Reference: D.6.2.3)** and shown **Figure 3.2 (Document Reference: D.6.4.3.2)** of the **ES**.

Table 3-1: Noise Sensitive Receptors

Value / Sensitivity Receptor	Value / Sensitivity Receptor
High	Section 1: 504 dwellings and no other sensitive receptors
High	Section 2: 107 dwellings and one other sensitive receptor
High	Section 3: 322 dwellings and two other sensitive receptors
High	Section 4: 1153 dwellings and six other sensitive receptors
High	Section 5: 1710 dwellings and six other sensitive receptors
High	Section 6: 31 dwellings and no other sensitive receptors
High	Section 7: 12 dwellings and no other sensitive receptors

3.1.3. It can be seen from the table that the majority of sensitive receptors are concentrated in Sections 4 and 5. These sections correspond to the residential areas in Sandycroft, Ewloe, Ewloe Green and near Northop Hall AGI.

3.1.4. A subset of the receptors above within 100m from the Newbuild Infrastructure Boundary has been assessed for likely vibration effects.

ECOLOGICAL RECEPTORS

3.1.5. Ecological receptors recorded across the DCO Proposed Development may be impacted upon by noise and vibration during the construction stage. Full details of the potential impacts and effects on ecological receptors during the construction stage are detailed within **Chapter 09** of the **ES (Document Reference: D.6.2.9)**.

3.1.6. Species potentially at risk from construction affiliated noise and vibrational affects include:

- Bats.
- Barn Owl.
- Aquatic receptors (including fish).
- Badger.

- Birds.
- Riparian mammals.

3.1.7.

Mitigation measures have been included within Section 4 of this ONVMP. Further measures will be included, as required, within the NVMP developed at the Detailed Design stage and in response to site conditions at the time of works.

4. MITIGATION AND INCIDENT MANAGEMENT

4.1.1. This section of the ONVMP sets out the mitigation and management measures and any incident management and reporting requirements during the construction stage.

4.2. GENERAL REQUIREMENTS

4.2.1. General noise and vibration control measures are listed in BS 5228:2009+A1:2014 which is the primary guidance for the assessment and control of noise and vibration from construction works.

4.2.2. Relevant recommendations of BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 will be implemented, together with the specific requirements of this management plan.

4.3. BEST PRACTICABLE MEANS

4.3.1. Best Practicable Means (BPM) is defined in Section 72 of the CoPA 1974 and Section 79 of the Environmental Protection Act 1990 as those measures which are:

“Reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications”.

4.3.2. The Construction Contractor(s) will implement mitigation in the following order:

- BPM, as defined above, including (this has been further detailed out as **General Measures** under **Section 4.4** of this document):
 - Noise and vibration control at source; for example, the selection of quiet and low vibration equipment, review of construction methodology to consider quieter methods, location of equipment on site, control of working hours, the provision of acoustic enclosures and the use of less intrusive audible warnings such as broadband vehicle reversing alarms; and
 - screening: design and use of acoustic screening measures where practicable and necessary, to include site hoardings, acoustic barriers, acoustic enclosures, acoustic housing for plant and temporary stockpiles. Such measures can be particularly appropriate for stationary or near-stationary plant. Barriers will be located as close to the plant as possible.
- should the application of BPM at source or by screening not prove effective and noise exposure exceeds the relevant trigger level (**as defined in BS 5228-1, Table E.2**), the Construction Contractor(s) may offer:
 - noise insulation or if that is not practical or effective;
 - temporary re-housing through consultation with the Local Planning Authority (**D-NV-010** of the **REAC, Document Reference: D.6.5.1**)

4.4. SPECIFIC NOISE AND VIBRATION CONTROL MEASURES

SPECIFIC MEASURES

- 4.4.1. Specific noise and vibration measures, limits to be met and a programme of noise and vibration monitoring shall be specified as part of the Detailed Design and construction phases of the DCO Proposed Development within the NVMP (**D-NV-001** of the **REAC**, **Document Reference: D.6.5.1**).
- 4.4.2. Additional consideration shall be taken while designing and executing works for trenchless activities (**D-NV-012** of the **REAC**, **Document Reference: D.6.5.1**) in particular in locations where the worst-case working hours for undertaking such installation will be a full 24-hour period for up to 4 weeks at the following locations:
- TRS 01: Hapsford railway line (and spur to Encirc glass factory)
 - TRS 02: A5117 (north of M56 Chester Services)
 - TRS 28: River Dee
 - TRS 31/32: Chester Road
 - TRS 38: Church Lane
 - TRS 37: A494
- 4.4.3. As per **Chapter 15** of the ES (**Document Reference: D.6.2.15**), the noise assessment for trenchless installations was based on a horizontal directional drilling (HDD) method, as the reasonable worst case for noise implications.
- 4.4.4. As details emerge during the Detailed Design, each schedule of works will require a desktop review from the noise and vibration consultant. This shall include, but is not limited to, review of the schedule of works, analysis of sensitive receptors, undertaking 3D noise modelling following methodology in BS5228-1, outline specific mitigation measures, etc. This will ensure any location specific requirements are identified before commencing the works.
- 4.4.5. A set of enhanced mitigation measures will be provided for sensitive receptors subject to significant adverse effects as a result of the trenchless activities during night-time. These specific activities will be agreed with the Local Planning Authority by means of a Section 61 application setting the specific mitigation measures proposed to minimise the significant adverse effects. The Local Planning Authority will have the opportunity to comment on each of these submissions in advance of the trenchless activity works. More information on the Section 61 application process is provided later in this document.

GENERAL MEASURES

- 4.4.6. In all works locations the Construction Contractor(s) will follow standard good construction practice as outlined in BS 5228-1:2009+A1:2014 for noise and BS 5228-2:2009+A1:2014 for vibration.
- 4.4.7. This will include the following BPM measures:

- Selection of quiet and low vibration equipment and methodologies (**D-NV-004** of the **REAC, Document Reference: D.6.5.1**);
- Review of construction programme and methodology to consider low noise/low vibration methods (including non-vibratory compaction plant where required) (**D-NV-001** of the **REAC, Document Reference: D.6.5.1**);
- Optimal location of equipment on site to minimise noise disturbance (**D-NV-006** of the **REAC, Document Reference: D.6.5.1**);
- The provision of acoustic enclosures around static plant, where necessary (**D-NV-005, D-NV-007** of the **REAC, Document Reference: D.6.5.1**);
- Use of less intrusive alarms, such as broadband vehicle reversing warnings (**D-NV-008** of the **REAC, Document Reference: D.6.5.1**);
- Compliance with the working hours as agreed with the Local Planning Authority under Section 61 (**D-NV-002** of the **REAC, Document Reference: D.6.5.1**);
- Plant and equipment will be shut down when not in use (**D-AQ-016** of the **REAC, Document Reference: D.6.5.1**);

ECOLOGICAL RECEPTOR MITIGATION

4.4.8.

In addition to the above mitigation measures, the following mitigation measures in relation to potential noise and vibration effects upon ecological receptors will be included within the NVMP. Measures may include:

- Use of temporary acoustic barriers will be considered around significant noise producing plant that are in close proximity to ecological receptors and those receptors assessed within the **Habitats Regulations Assessment (HRA) [REP4-243]** (**D-NV-005** of the **REAC, Document Reference: D.6.5.1**);
- Use of temporary acoustic enclosures around static plant;
- Measures to minimise and avoid disturbance or avoidance behaviour of fish species, where works are in close proximity to watercourses. Measures include soft-starts to pile driving to enable fish dispersal, utilisation of press or vibratory pile driving methods, or bored driving methods and phased or intermittent work and schedules (break periods) to allow for windows of fish recovery and movement through the works area (**D-BD-057** of the **REAC, Document Reference: D.6.5.1**);
- Where bat roosts have been identified within trees and structures, an exclusion buffer will be demarcated according to the roost type as detailed within items **D-BD-025** and **D-BD-026**. The Ecological Clerk of Works (ECoW) will determine if further mitigation measures to minimise noise and vibration disturbance depending on the roost type, timing and location and extent of works at each roost location.
- As per **D-BD-040** of the **REAC (Document Reference: D.6.5.1)**, construction in proximity to barn owl nest sites that have not been subject to temporary exclusion measures (i.e. nests that have established after

construction commencement) will be temporarily and spatially restricted to avoid or reduce impacts of noise and vibration disturbance in accordance with the criteria below (developed in accordance with good practice). Where works need to be conducted within the minimum protection zone these will be discussed with the ECoW:

- Pedestrian movement of a Low to Medium Disturbance Risk, e.g., site personnel walking near nests / roosts, will implement a Minimum Protection Zone of 20m.
- Artificial lighting of a Low to Medium Disturbance Risk, e.g., illumination of works area (no direct lighting or nest/roost), will implement a Minimum Protection Zone of 30m.
- Vehicular movements of a Medium Disturbance Risk, e.g., vehicles or heavy plant moving past nest / roost sites, will implement a Minimum Protection Zone of 40m.
- General light building and landscape works of a Medium to High Disturbance Risk, e.g., laying concrete, using mechanised plant will implement a Minimum Protection Zone of 60m.
- Heavy construction of a High Disturbance Risk, e.g., piling or compaction works, ground levelling, crushing of materials will implement a Minimum Protection Zone of 175m.

4.4.9. The above REAC (**Document Reference: D.6.5.1**) commitments can also be found in Annex A.

4.5. SECTION 61 CONSENT APPLICATIONS

INTRODUCTION

4.5.1. It anticipated that Section 61 consents will be required for works associated with trenchless crossings. As the need is identified, the Construction Contractor(s) will submit applications for Section 61 consents, variations and dispensations under the Control of Pollution Act 1974 (CoPA) for all construction activities which are required to be undertaken outside of the core working hours, unless otherwise agreed with the appropriate Local Authorities (**D-NV-002** of the **REAC, Document Reference: D.6.5.1**). The full Section 61 process under the CoPA is illustrated in BS 5228-1:2009+A1:2014 at Figure A.1.

4.5.2. The Construction Contractor(s) will be required to demonstrate in the Section 61 application that BPM, as defined under Section 72 of the CoPA, are employed at all times for all activities, to minimise noise and vibration effects.

IMPLEMENTATION

4.5.3. Where a Section 61 consent is to be sought, before starting any construction activities, the Construction Contractor(s) will prepare and submit to the appropriate Local Authorities (Cheshire West and Chester Council and

Flintshire County Council) information which will include (**D-NV-002** of the **REAC, Document Reference: D.6.5.1**):

- An outline of the proposed construction methods, types and numbers of plant to be used, and percentage on-time;
- Definition of the working hours required and a justification for the working hours sought;
- A work programme which identifies the location and duration of each noise and/or vibration generating activity;
- The sound power levels, or sound pressure level at 10 m, for each item of plant for each relevant activity;
- Appropriate (in terms of noise / vibration level, duration and working hours) justification that the method and plant proposed demonstrates that BPM has been employed to control noise and vibration impacts;
- Predicted noise and vibration levels at specified locations supported by calculations following the methodology in BS 5228-1:2009+A1:2014 for noise and BS 5228-2:2009+A1:2014 for vibration, the likely effects of these levels on affected NVSRs, and the likely durations of these effects;
- All steps to be employed to minimise noise and vibration during the works;
- Proposals for noise and vibration monitoring including frequency, locations relative to each work site, reporting proposals etc.; and
- Proposals for the notification of receptors affected by works.

4.5.4. The number, extent (geographically and in terms of construction activities) and duration of Section 61 applications will be the subject of timely consultation between the Construction Contractor(s) and Local Authorities. Applications will be submitted to the appropriate Local Planning Authority for discussion and agreement at least 28 days in advance of works commencing.

4.5.5. The Local Planning Authority to whom the consent application is submitted is required to inform the Construction Contractor(s) of its decision within 28 days of the final application being received. If that does not occur, then there shall be an appeals process.

4.5.6. Notification of the start of works and the provision of advanced information to local stakeholders is a key part of mitigating the effect of noise and vibration (**D-NV-0012** of the **REAC (Document Reference: D.6.5.1)**).

4.5.7. This shall also mean that any changes or rescheduling of planned works (for which a Section 61 has been applied or consented) for reasons not envisaged at the time of application submission, the Construction Contractor(s) is responsible to submit dispensation/ variations form to the appropriate Local Planning Authority. This shall be done prior to commencement of works. The dispensation shall be appropriately backed by a statement of variation to the agreed matters, a revised construction programme or method and relevant noise calculations.

4.5.8. Where the rescheduling relates to work of a more urgent or critical nature (such as a key activity likely to delay another key activity or activities), the Construction Contractor(s) will apply to Cheshire West and Chester Council and Flintshire County Council using the Section 61 application process. This change application will be issued up to seven days (but at least two working days) before the start of those works.

4.5.9. The Construction Contractor(s) will maintain an up-to-date log of all relevant agreed hours and controls on working. This will incorporate any changes to working hours or practices set out in this ONVMP which have been agreed through the Section 61 process.

4.6. TEMPORARY RE-HOUSING

4.6.1. Temporary rehousing will be considered through consultation with the relevant Local Planning Authority for specific locations where other mitigation measures do not provide sufficient attenuation to prevent sleep disturbance during activities in the night-time period (**D-NV-010** of the REAC, **Document Reference: D.6.5.1**);

4.6.2. Particularly, noise sensitive receptors near trenchless crossing activities will require careful consideration and construction planning. Where required, the Construction Contractor(s) will offer temporary re-housing to qualifying parties if the following criteria are met as a minimum:

- Noise levels are predicted or measured to exceed by 10 dB the relevant SOAEL defined in the **ES Chapter 15 (Document Reference: D.6.2.15)** for at least 10 days out of any period of fifteen consecutive days or alternatively 40 days in any six-month period at affected properties; and
- The property is lawfully occupied as a permanent dwelling.

4.6.3. This represents additional protection for a residential property in the event that it is not practical to mitigate construction noise on site or reduce construction noise to tolerable levels.

4.6.4. Affected parties will be notified in advance of the commencement of works which may cause the relevant trigger levels to be exceeded. The acceptance of the offer of temporary re-housing would be voluntary.

4.6.5. The offer of temporary rehousing is primarily applicable to residential buildings. However, the Construction Contractor(s) will consider all applications supported by evidence for temporary rehousing from occupiers who may have special circumstances. Special circumstances could include caravan sites, night workers, those working in home occupations, local businesses or buildings that provide community facilities requiring a particularly quiet environment and those with a medical condition which will be seriously aggravated by construction noise and provide temporary re-housing where it is demonstrated that this is necessary.

- 4.6.6. The Construction Contractor(s) will identify any buildings and/or their occupants which may not be adequately protected by the significance criteria in **Chapter 15** of the ES (**Document Reference: D.6.2.15**). The Construction Contractor(s) will agree with the Local Planning Authority suitable criteria for temporary re-housing in accordance with guidance in BS5228-1 Annex E (Informative).
- 4.6.7. The Construction Contractor(s) shall ensure that trigger levels for each site work package/ specific work section are included in the NVMP and agreed upon with the Local Planning Authorities.
- 4.6.8. The Construction Contractor(s) will inform the appropriate Local Planning Authority and owners / occupiers should it be identified that temporary re-housing is required.

5. MONITORING STRATEGY

5.1. SITE MONITORING

- 5.1.1. In accordance with item **D-NV-013 (REAC, Document Reference: D.6.5.1)**, the Construction Contractor(s) will undertake, and report monitoring to ensure and demonstrate compliance with all noise and vibration commitments and the requirements of the NVMP.
- 5.1.2. Monitoring will include regular onsite observation monitoring and checks/audits to ensure that BPM is being employed at all times. The monitoring checks will be undertaken on varying days each week and at different times of day, in order to capture monitoring information in a range of scenarios. The site reviews will be logged, and any remedial actions recorded. Such checks will include:
- Compliance with hours of working;
 - Presence of mitigation measures e.g. engines doors closed, airlines not leaking, and site hording in place;
 - Number and type of plant;
 - Compliance with agreed working methods; and
 - Compliance with any specific requirements of the NVMP.

5.2. INSTRUMENTATION

- 5.2.1. The instrument should conform to the requirements for integrating averaging sound level meters, preferably type 1 as specified in BS 7580-1:1997, but at least of type 2 as specified in BS 7580-2:1997.
- 5.2.2. Adequate proof of calibration for the instrumentation tested in accordance with BS EN 61672-2:2013 shall be provided,
- 5.2.3. Appropriate calibration checks before, during (maintenance visits for long term measurements) and after measurements shall be recorded.

5.3. NOISE AND VIBRATION MONITORING SCHEME

CONSTRUCTION PHASE

- 5.3.1. A hybrid approach to noise and vibration monitoring will be undertaken using a combination of both short-term measurements and long-term (unattended) continuous measurements.
- 5.3.2. The locations and frequency of measurements will be specified in the NVMP.

Construction Phase - Short-term noise and vibration monitoring

- 5.3.3. It is recommended that attended measurements regime be carried out as specified under BS 5228-1:2009+A1:2014¹ and BS 5228-2:2009+A1:2014².
- 5.3.4. The site visits shall be conducted during day or night for either weekdays or weekends as agreed under the Section 61 applications or through consultation with the Local Planning Authority. The NVMP will include locations, frequency, duration, etc. It is anticipated that locations subject to potential significant effects arising as a result of the trenchless crossing activities will be included as a minimum.
- 5.3.5. Monitoring reports/ memos shall be produced and submitted to the Applicant within a week of each visit detailing the results of the noise and vibration measurements.

Construction Phase - Long-term noise and vibration monitoring

- 5.3.6. This method is deemed to be the most robust method which entails permanently monitoring construction noise and vibration levels as outlined under BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014.
- 5.3.7. Continuous 24-hour noise monitoring, with trigger and notification capabilities, will be implemented by the Construction Contractor(s) at the Centralised Compounds and where there is a likelihood of significant effects outside of core hours (8am to 6pm Monday to Friday (excluding bank holidays) and from 8am to 1pm on Saturdays)) at the following trenchless crossings:
- TRS 01: Hapsford railway line (and spur to Encirc glass factory)
 - TRS 02: A5117 (north of M56 Chester Services)
 - TRS 28: River Dee
 - TRS 31/32: Chester Road
 - TRS 38: Church Lane
 - TRS 37: A494
- 5.3.8. The monitoring will enable the investigation of potential complaints if raised. The specific monitoring locations and methodology will be agreed with the Local Planning Authorities and will form part of the NVMP and Section 61 applications in relation to these trenchless crossing locations (**D-NV-013** of the REAC, **Document Reference: D.6.5.1**)
- 5.3.9. The monitoring strategy shall be further outlined as part of the NVMP based on the schedule of works and Section 61 agreement or any consultation

¹ BS 5228-1:2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (**Annex G**)

² BS 5228-2:2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (**Chapter 9**)

with the Local Planning Authority. This shall include, but not limited to locations, frequency, duration, additional logistics, etc.

5.3.10. The instrumentation shall exhibit capacity to remotely access results, trigger noise levels and notification for immediate action to avoid any complaints.

5.3.11. A memo shall be produced on a monthly basis with a summary of continuous noise and vibration measurement results over the preceding period.

5.4. SITE-SPECIFIC MONITORING

5.4.1. The Construction Contractor(s) will provide further details of the site-specific monitoring strategy in the NVMP.

6. STAKEHOLDER ENGAGEMENT

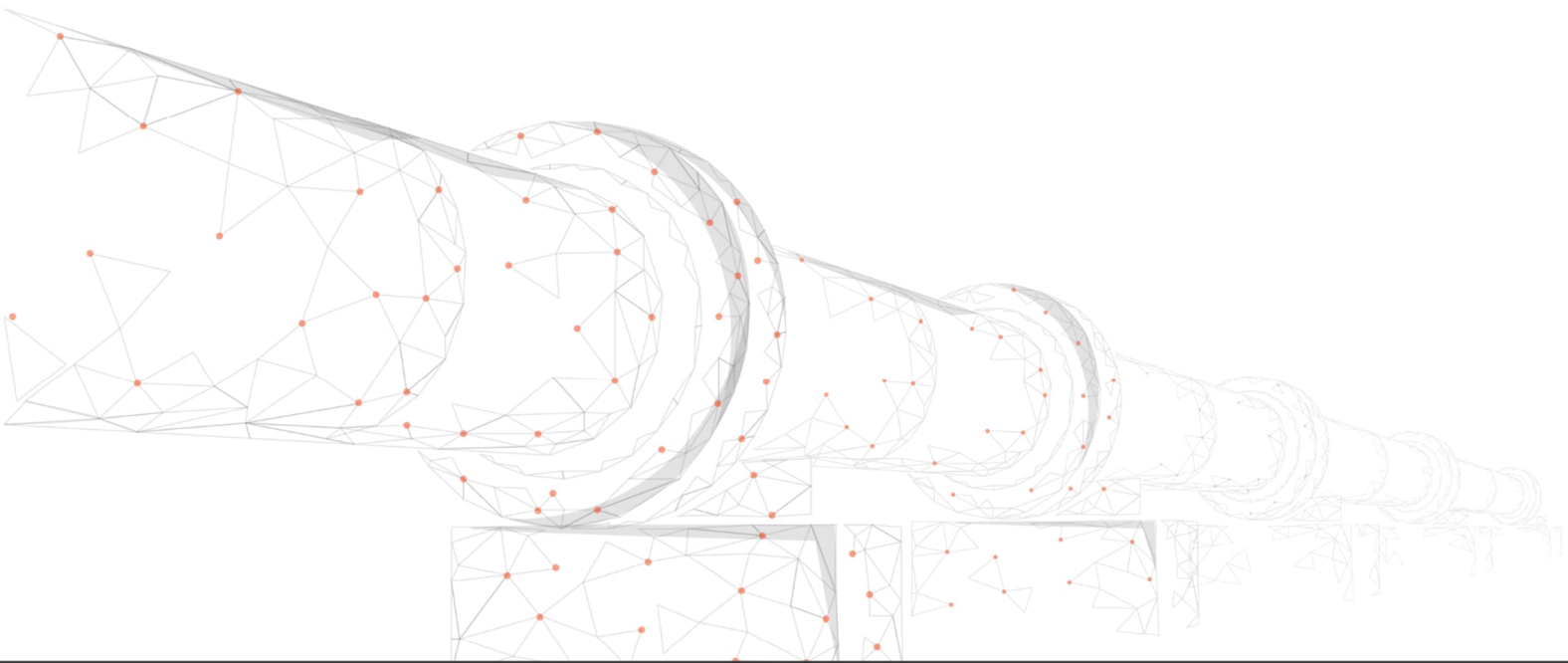
6.1. COMMUNICATION

- 6.1.1. The Construction Contractor(s) will provide information regarding the works to the Local Planning Authority as updates of the NVMP are prepared and via S61 application, for trenchless crossing activities requiring out of core-hours works.
- 6.1.2. In the case of works required in response to an emergency, the applicable Local Planning Authority, local residents and any other potentially affected stakeholders will be advised, within an agreed timeframe with the Local Planning Authority, that emergency works are taking place.
- 6.1.3. The Applicant will provide personnel and resources needed to deliver the communications, stakeholder and community activities associated with the DCO Proposed Development and will support the Local Planning Authorities in delivering the Project communications, stakeholder and community outcomes. Further detail will be included in the Stakeholder Communications plan which will be based on the Outline Stakeholder Communications Plan (**Document Reference: D.7.45**).

6.2. COMPLAINTS PROCEDURE

- 6.2.1. Local Planning Authorities must investigate complaints about noise that could be a 'statutory nuisance' (covered by the Environmental Protection Act 1990). For noise to be considered as statutory nuisance it must do one of the following:
- Unreasonably and substantially interfere with the use or enjoyment of a home or other premises;
 - Injure health or be likely to injure health.
- 6.2.2. In an event of receiving a noise complaint, the Applicant will assist the Local Planning Authority to implement noise or vibration monitoring or both (depending upon the nature of the complaint) at the location, in case the same is not in process, upon agreement of all parties.
- 6.2.3. The Applicant will work with the Construction Contractor(s) to investigate the instance when the complaint was placed and provide a root cause analysis along with a way forward to assist the noise and vibration management of other locations with similar activities in the future. The investigation report shall be submitted to the Local Planning Authority within seven days of receiving a noise complaint.

Annexures



Annex A

NOISE AND VIBRATION, AND ECOLOGICAL RECEPTOR MITIGATION REAC COMMITMENTS

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
D-NV-001	The Noise and Vibration Management Plan will detail the noise mitigation measures included in the Detailed Design, the noise and vibration limits to be met and a programme of noise and vibration monitoring which should be followed during the Construction Stage.	Provide a mitigation scheme based on final design. The Noise and Vibration Mitigation Plan will seek to avoid significant effects (daytime, evening and night-time), where reasonably practicable.	Construction Contractor(s)
D-NV-002	Prior to construction works commencing, consultation will take place with the Local Planning Authorities Environmental Health Officers (or equivalent positions and/or further stakeholders as appropriate) to agree the parameters to be included in the Noise and Vibration Management Plan. This will include, but is not limited to, appropriate consents and agreements (e.g. Section 61) and best practice measures and specific mitigation measures to ensure that the noise and vibration effects reported in the ES is, as a minimum, achieved. The consultation will also cover the mitigation	Agreement of Noise and Vibration Management Plan	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
	measures included to avoid significant effects during the operational phase.		
D-NV-003	The Construction Contractor(s) will nominate a Community Liaison Representative (or equivalent title) who will be a nominated competent site contact for whom the contact details will be shared with local residents and other third parties within close proximity to the construction works, and will be displayed clearly within the site compounds. The Community Liaison Representative will be responsible for engaging with any noise or vibration related matters raised by third parties. Responsibilities should be clearly stated in the Noise and Vibration Management Plan.	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)
D-NV-004	Construction works will utilise low noise generating plant and equipment and will adopt methods which minimise noise and vibration, wherever practicable.	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)
D-NV-005	Where required, temporary acoustic barriers will be considered around significant noise producing plant that are in close proximity to sensitive receptors. The locations of these screens will be optimised for acoustic mitigation whilst considering other potential impacts. The location and design of the temporary acoustic barriers will be detailed in conjunction with the Landscape Architect to ensure impacts upon landscape character and visual amenity are avoided and do not give rise to increased levels	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
	of effect as reported in Chapter 12 of the ES. Particular consideration will be given to PRow, residential receptors and ecological receptors (including those assessed within the HRA).		
D-NV-006	Optimal location(s) of all equipment with the potential to cause a significant effect on noise on site will be agreed with the Local Authorities as part of the Noise and Vibration Management Plan prior to construction to minimise noise disturbance to local sensitive receptors.	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)
D-NV-007	During construction, the Construction Contractor(s) will ensure that the provision of acoustic enclosures around static plant, where practicable, is in place to reduce noise disturbance. The Noise and Vibration Management Plan will stipulate where this is necessary.	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)
D-NV-008	Construction vehicles will, wherever practicable, be fitted with less intrusive warning alarms, such as broadband vehicle reversing warnings.	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)
D-NV-009	Temporary noise screening methods and management such as low noise equipment, hoarding etc as per agreement with the Local Planning Authorities EHO (or equivalent positions and/or further stakeholders as appropriate) should achieve a minimum attenuation of 10 dB(A) at all sensitive locations during construction where the noise impact in the ES and HRA were identified. During detailed design,	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
	the Construction Contractor(s) will explore further attenuation opportunities to mitigate any residual impacts at all sensitive locations, where required.		
D-NV-010	<p>The construction and decommissioning programme will seek to minimise the duration of high noise generating construction activities, as far as practicably possible.</p> <p>Where construction and decommissioning activities near sensitive areas are expected to affect residents with a magnitude of medium and high, and exceed the durations of 10 or more days or nights in any 15 consecutive days or nights, or a total number of days exceeding 40 in any 6 consecutive months, then a set of enhanced mitigation measures will be discussed and agreed with the Local Planning Authority. Temporary re-housing will be also considered through consultation with the Local Planning Authority for specific locations where other mitigation measures do not provide sufficient attenuation to prevent sleep disturbance during activities in the night-time period.</p>	Best Practicable Means to minimise noise and vibration impacts.	The Applicant / Construction Contractor(s)
D-NV-012	<p>Construction works will be programmed to the following core hours: 8am to 6pm Monday to Friday (excluding bank holidays) and from 8am to 1pm on Saturdays).</p> <p>Any exceptions to this, such as for works associated with trenchless crossings or any other unexpected requirement to work outside of the core construction working hours, will be</p>	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
	discussed and agreed prior to such works commencing with the Local Planning Authority's EHO (or equivalent position and/or further stakeholders as appropriate). This includes, where relevant, agreeing any additional noise mitigation with the EHO/s, and notifying local residents/communities of planned works outside of core construction hours prior to such works commencing.		
D-NV-013	<p>Noise and vibration monitoring during the Construction Stage at locations stipulated in the Noise and Vibration Management Plan. As part of the Plan, a set of representative monitoring locations will be agreed along with actions for the Construction Contractor(s) when the likelihood of significant effect is triggered.</p> <p>Continuous 24-hour noise monitoring, with trigger and notification capabilities, will be implemented by the Construction Contractor(s) at the Centralised Compounds and where there is a likelihood of significant effects outside of core hours (8am to 6pm Monday to Friday (excluding bank holidays) and from 8am to 1pm on Saturdays)) at the following trenchless crossings:</p> <ul style="list-style-type: none"> • TRS 01: Hapsford railway line (and spur to Encirc glass factory) • TRS 02: A5117 (north of M56 Chester Services) • TRS 28: River Dee 	Best Practicable Means to minimise noise and vibration impacts.	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
	<ul style="list-style-type: none"> • TRS 31/32: Chester Road • TRS 38: Church Lane • TRS 37: A494 		

Ecological Receptor Mitigation Commitments

<p>D-BD-025</p>	<p>Maternity or hibernation bat roosts identified during baseline and pre-commencement surveys will be retained and an exclusion buffer of a minimum of 30m physically demarcated around any identified tree or structure to safeguard roosts from construction affiliated impacts. Should the ECoW determine that construction works type, duration, extent poses a risk to the integrity of a roost it may be necessary to implement seasonal restrictions on work outwith the recognised maternity or hibernation period for the species identified. Where this is not possible it will be necessary to apply for an EPSL, devising appropriate mitigation to mitigate for loss/disturbance to a roost. Maternity roosts known to date include T321 (noctule <i>Nyctalus noctula</i> maternity roost).</p> <p>It is not currently anticipated that any maternity or hibernation roosts will be lost as a result of construction of the DCO Proposed Development.</p>	<p>To avoid adverse impacts on protected species. To protect the Conservation Status of local bat populations</p>	<p>Construction Contractor(s)</p>
<p>D-BD-026</p>	<p>The detailed design alignment of the Newbuild Carbon Dioxide Pipeline will wherever practicable, physically demarcate a minimum 10 m exclusion buffer around all buildings with confirmed bat roosts. Where this is not possible, potential impacts to roosts will be assessed in respect of the type, extent and duration of works proposed, by the ECoW. At the discretion of the ECoW it may be possible to reduce the exclusion buffer. Where risk of damage/disturbance of a roost persists after assessment, a EPSL will be applied for, with works only allowed to proceed following receipt of a granted licence from NE/NRW and implementation of any necessary mitigation.</p>	<p>To avoid adverse impacts on protected species To protect the Conservation Status of local bat populations.</p>	<p>Construction Contractor(s)</p>
<p>D-BD-040</p>	<p>Construction in proximity to barn owl nest sites that have not been subject to temporary exclusion measures (i.e. nests that have</p>	<p>To comply with conservation legislation and protect barn owl.</p>	<p>Construction Contractor(s)</p>

Ecological Receptor Mitigation Commitments

established after construction commencement) will be temporarily and spatially restricted to avoid or reduce impacts of disturbance in accordance with the criteria below (developed in accordance with good practice).

- Pedestrian movement of a Low to Medium Disturbance Risk, e.g., site personnel walking near nests / roosts, will implement a Minimum Protection Zone of 20m.
- Artificial lighting of a Low to Medium Disturbance Risk, e.g., illumination of works area (no direct lighting or nest/roost), will implement a Minimum Protection Zone of 30m.
- Vehicular movements of a Medium Disturbance Risk, e.g., vehicles or heavy plant moving past nest / roost sites, will implement a Minimum Protection Zone of 40m.
- General light building and landscape works of a Medium to High Disturbance Risk, e.g., laying concrete, using mechanised plant will implement a Minimum Protection Zone of 60m.
- Heavy construction of a High Disturbance Risk, e.g., piling or compaction works, ground levelling, crushing of materials will implement a Minimum Protection Zone of 175m.

It is assumed that works will be undertaken during daylight hours, however, some night time work will be required. Where works need to be conducted within the minimum protection zone these will be discussed with the ECoW, and where necessary a barn owl licensed ecologist, who will assess the proposed works, duration and extent and potential use of mitigation to facilitate works. Where works are deemed to pose a significant risk to nesting barn owl, licensing may be required and/or the rescheduling of works to periods outwith the most sensitive period (March to June inclusive),

Ecological Receptor Mitigation Commitments

	however, this would be at the discretion of the ECoW/barn owl licensed ecologist.		
D-BD-057	Sensitivity (to noise and vibration) of those fish species present will be considered to ensure that appropriate construction methods can be implemented to minimise and avoid disturbance or avoidance behaviour. Implementation of a Noise and Vibration Management Plan, to be prepared at the Detailed Design stage, will include, where practicable; soft-starts to pile driving to enable fish dispersal, utilisation of press or vibratory pile driving methods, or bored driving methods and phased or intermittent work schedules (break periods) to allow for windows of fish recovery and movement through the works area.	To avoid adverse impacts to protected species and comply with conservation legislation	Construction Contractor(s)