

## ENVIRONMENTAL STATEMENT (VOLUME II)

### Chapter 19 Combined and Cumulative Effects

#### HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 –  
Regulations 5(2)(a)

Document Reference Number D.6.2.19

Applicant: Liverpool Bay CCS Limited

Inspectorate Reference: EN070007

English Version

REVISION: A

DATE: September 2022

DOCUMENT OWNER: WSP UK Ltd

PUBLIC

# QUALITY CONTROL

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<b>Issue/Revision</b>	<b>First Issue</b>	<b>Revision 1</b>	<b>Revision 2</b>	<b>Revision 3</b>
Document Reference	D.6.2.19	D.6.2.19		
Revision	01	A		
Author Name and Sign	JK	JK		
Approver Name and Sign	JW	JW		
Document Owner	WSP UK Ltd	WSP UK Ltd		

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## 19. COMBINED AND CUMULATIVE EFFECTS

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### 19.1. INTRODUCTION

- 19.1.1. This Chapter reports the assessment of the likely significant effects of the Development Consent Order (DCO) Proposed Development on Combined and Cumulative Effects, and describes:
- Relevant, legislation, policy and guidance;
  - Consultation undertaken;
  - Assessment methodology;
  - Baseline conditions;
  - Sensitive receptors;
  - Assessment of likely impacts and effects;
  - Mitigation and enhancement measures;
  - Residual effects;
  - Monitoring; and
  - Next steps.
- 19.1.2. This Chapter (and its associated figures and appendices) is intended to be read as part of the wider Environmental Statement (ES), with particular reference to **Technical Chapters 6-18 (Volume II)**.
- 19.1.3. This Chapter has been prepared by competent experts with relevant and appropriate experience. Expertise and competency details are detailed in **Appendix 5.1 - Relevant Expertise and Competency (Volume III)**.
- 19.1.4. The objectives of the assessment are two-fold. Firstly, it assesses cumulative or inter-project effects: in other words, how the effects of the DCO Proposed Development interact with the effects of other developments. Secondly it assesses combined, or intra-project effects, or the effects that occur between the different environmental topics due solely to the DCO Proposed Development.
- 19.1.5. Inter-project effects are addressed in more detail in **Appendix 19.1 - Inter-Project Effects Assessment (Volume III)**; intra-project effects are addressed in more detail in **Appendix 19.2 - Intra-Project Effects Assessment (Volume III)**.

## 19.2. LEGISLATIVE AND POLICY FRAMEWORK

### LEGISLATIVE FRAMEWORK

#### **The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref. 19.3)**

19.2.1. These Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the ‘DCO EIA Regulations’) regulations cover the process of EIA in the context of Nationally Significant Infrastructure Projects. They apply the amended EU Directive 2014/52/EU.

19.2.2. Paragraph 5, Schedule 4 of the Regulations state that an ES should include:

*“A description of the likely significant effects of the development on the environment resulting from, inter alia:*

*(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.”*

19.2.3. The description of likely significant effects on the factors: *“[...] should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.”*

#### **The Town and Country Planning (Wales) (Environmental Impact Assessment) Regulations 2017 (Ref. 19.4) and The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (Ref. 19.5)**

19.2.4. These regulations provide specific thresholds of scale to determine if a development requires EIA. Planning Inspectorate Advice Note 17 specifies that statutory definitions of EIA screening thresholds can be of assistance when considering whether the scale and nature of the developments identified in the Zone of Influence (ZOI) are likely to interact with the proposed project development and to result in a cumulative effect.

### POLICY

#### **The National Planning Policy Framework (NPPF) 2021 (Ref. 19.7)**

19.2.5. Paragraph 185 states:

*“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.”*

## **Overarching National Policy Statement for Energy (EN-1) (Ref. 19.8)**

19.2.6. Paragraph 4.1.3 states:

*“In considering any proposed development, and in particular when weighing its adverse impacts against its benefits, the IPC should take into account [...] its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.”*

19.2.7. Paragraph 4.2.5 states:

19.2.8. *“When considering cumulative effects, the ES should provide information on how the effects of the applicant’s proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence). The IPC may also have other evidence before it, for example from appraisals of sustainability of relevant NPSs or development plans, on such effects and potential interactions. Any such information may assist the IPC in reaching decisions on proposals and on mitigation measures that may be required.”*

### **GUIDANCE**

#### **Planning Inspectorate Advice Note 17: Cumulative Effects Assessment (Ref. 19.1)**

19.2.9. This advice note identifies the nature of projects (referred to as ‘other developments’ in the Advice Note) that should be considered in a cumulative effects assessment. It advises that a pragmatic approach should be undertaken in respect of what is feasible and reasonable, where there is a lack of information to identify impacts and assess effects.

#### **Planning Inspectorate Advice Note 9: Rochdale Envelope (Ref. 19.9)**

19.2.10. This advice note affirms the established principle that:

*“The ES should not be a series of separate unrelated topic reports. The inter-relationship between aspects of the proposed development should be assessed and careful consideration should be given by the developer to explain how inter-relationships have been assessed in order to address the environmental impacts of the proposal as a whole. It need not necessarily follow that the maximum adverse impact in terms of any one topic impact would automatically result in the maximum potential impact when a number of topic impacts are considered collectively. In addition, individual impacts may not be significant but could become significant when their interrelationship is assessed. It will be for the developer to demonstrate that the likely significant impacts of the project have been properly assessed.”*

### 19.3. SCOPING OPINION AND CONSULTATION

- 19.3.1. An **EIA Scoping Opinion (Appendix 1.2, Volume III)** was received by the Applicant from the Planning Inspectorate (The Inspectorate) on 14 July 2021, including formal responses from Statutory Consultees. A full list of the responses from The Inspectorate and how these requirements have been addressed by the Applicant are set out in **Appendix 1.3 - Scoping Opinion Responses (Volume III)**.
- 19.3.2. The responses from the Local Planning Authority (LPA) in relation to Combined and Cumulative Effects and how these requirements have been addressed by the Applicant have been set out in **Appendix 1.3 - Scoping Opinion Responses (Volume III)**.
- 19.3.3. **Table 19.1** provides a summary of the consultation undertaken to inform the Combined and Cumulative Effects assessment to date.

**Table 19.1 – Summary of Consultation Undertaken**

<b>Body / organisation</b>	<b>Meeting dates and other forms of consultation</b>	<b>Summary of outcome of discussions</b>
Cadent Gas Limited Cadent EIA Team	07 June 2022	Agreed a consistent methodology for the Combined and Cumulative Effects assessment for the Other Development (1g) <sup>1</sup> and the DCO Proposed Development. The agreed approach for both DCOs was to follow Advice Note 17 guidance. Further information on the approach taken is provided in <b>Section 19.8</b>

### 19.4. SCOPE OF THE ASSESSMENT

- 19.4.1. The scope of this assessment was established through an approach described in detail in **Chapter 5 - EIA Methodology (Volume II)** of this ES. This reiterates the evidence base for scoping out elements following further iterative assessment.

#### **ELEMENTS SCOPED OUT OF THE ASSESSMENT**

- 19.4.2. The elements shown in **Table 19.2** and **Table 19.3** are not considered to give rise to likely significant effects as a result of the DCO Proposed Development and have therefore not been considered within this assessment.

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<sup>1</sup> Other Development 1g is described in detail in **Appendix 19.1 - Inter-Project Effects Assessment (Volume III)**.

**Table 19.2 – Elements Scoped Out of Inter-Project Effects Assessment**

Element Scoped Out	Justification
Decommissioning Stage	Certainty around the date of decommissioning is not clear at the time of this assessment, but it is assumed to be too far in the future for an assessment of inter-project effects to take place. As a result, an assessment of decommissioning inter-project effects is not considered practicable and is scoped out.
Air Quality – Construction and Operation Stages	All residual effects in <b>Chapter 6 - Air Quality (Volume II)</b> have been found to be negligible. Therefore, an inter-project effect is unlikely.
Climate Resilience – Construction Stage	All residual effects in <b>Chapter 7 - Climate Resilience (Volume II)</b> have been found to be negligible. Therefore, an inter-project effect is unlikely.
Cultural Heritage - Below Ground Heritage Assets	For below ground heritage assets (see <b>Chapter 8 - Cultural Heritage, Volume II</b> ), it is not feasible to quantify accurately the nature of resources within the Zone Of Influence, which would enable the identification of any inter-project effects during construction. In addition, any effects on assets would already be realised by the operation phase. As a result, below ground heritage assets are excluded from both phases of the Inter-Project Effects Assessment.
Cultural Heritage – Construction Stage	All non-below ground effects in <b>Chapter 8 - Cultural Heritage (Volume II)</b> in the Construction Stage have been found to be negligible. Therefore, an inter-project effect is unlikely.
Greenhouse Gas (GHG) Emissions	<p>The impact of GHG emissions (see <b>Chapter 10 - Greenhouse Gases, Volume II</b>), in terms of their contribution to climate change, is global and cumulative in nature, with every tonne contributing to impacts on natural and human systems. As such it is the cumulative effect of all GHG-emitting human activities that cause climate change, and therefore the assessment of the GHGs due to the Project implicitly assesses the cumulative effect of GHG emissions.</p> <p>In addition, the Project as a whole will capture and store CO<sub>2</sub> emissions and contribute to the UK's net zero carbon agenda. Therefore, the cumulative benefits of the DCO Proposed Development combined with the other elements of the Project will leave to a cumulative beneficial effect. Therefore, the assessment of GHGs has been scoped out.</p>
Biodiversity – Operation Stage	All Operation Stage residual effects in <b>Chapter 9 - Biodiversity (Volume II)</b> have been found to be negligible. Therefore, an inter-project effect is not possible.
Land and Soils – Operation Stage	All residual effects in the <b>Chapter 11 - Land and Soils (Volume II)</b> Operation Stage have been found to be negligible. Therefore, an inter-project effect is unlikely.
Landscape and Visual – Year 15 operation effects	The assessment of year 15 Operation Stage effects in <b>Chapter 12 - Landscape and Visual (Volume II)</b> is excluded from the assessment as all significant effects will have been effectively mitigated by this stage. The inter-

Element Scoped Out	Justification
	project effects with other developments are limited to those associated with the construction years and opening year.
Materials and Waste – Operation Stage	Operation Stage elements have been scoped out as the impacts of material resource consumption waste generation and disposal at this stage are considered to be minimal and the associated effects, not significant. Therefore, an inter-project effect is unlikely.
Noise and Vibration – Operation Stage	All residual effects in the <b>Chapter 15 - Noise and Vibration (Volume II)</b> Operation Stage have been found to be negligible (not significant) <sup>2</sup> . Therefore, an inter-project effect is unlikely.
Traffic and Transport – Operation Stage	The operation of the DCO Proposed Development will not result in significantly increased traffic flow or changes to traffic composition. Therefore, an inter-project effect is unlikely.
MA&D	MA&D is excluded from the assessment as a different assessment approach is used from the other technical chapter assessments within the ES (as detailed in <b>Chapter 13 - Major Accidents and Disasters (Volume II)</b> ). The vulnerability of the DCO Proposed Development to major events (including those posed by relevant other developments) is assessed rather than effects on sensitive receptors. As a result, an Inter-Project Effects Assessment considering MA&D is not practicable.

**Table 19.3 – Elements Scoped Out of the Intra-Project Effects Assessment**

Element Scoped Out	Justification
Air Quality – Construction, Operation and Decommissioning Stages	All residual effects in <b>Chapter 6 - Air Quality (Volume II)</b> have been found to be negligible. Therefore, intra-project effects are unlikely.
Climate Resilience – Construction Stage	No residual effects are anticipated in the Construction Stage assessment in <b>Chapter 7 - Climate Resilience (Volume II)</b> . As a result, Climate Resilience is scoped out of the Construction Stage Intra-Project Effects Assessment.
Heritage Assets – Construction, Operation and Decommissioning Stages	All effects in relation to heritage assets are already assessed within <b>Chapter 8 - Cultural Heritage (Volume II)</b> as this chapter considers all types of effects on heritage receptors. As a result, Cultural Heritage is scoped out of the Intra-Project Effects Assessment.
GHG Emissions – Construction,	All effects in relation to GHG Emissions are assessed within <b>Chapter 10 - Greenhouse Gases (Volume II)</b> . GHG

<sup>2</sup> In the Construction Stage all Minor Adverse effects are considered to be *not significant*.

<b>Element Scoped Out</b>	<b>Justification</b>
Operation and Decommissioning Stages	impacts by their nature could not act in a way that would combine with other impacts to result in a significant effect
Ecological Receptors – Construction, Operation and Decommissioning Stages	All intra-project effects in relation to ecological receptors are assessed within <b>Chapter 9 - Biodiversity (Volume II)</b> ; this includes impacts to water quality (in relation to turbidity and spillage of pollutants) and hydrological and hydromorphological processes on watercourses (as assessed in <b>Chapter 18 - Water Resources and Flood Risk (Volume II)</b> ), including those subject to statutory designation.
Land and Soils – Operation and Decommissioning Stage	All residual effects in the <b>Chapter 11 - Land and Soils (Volume II)</b> Operation and Decommissioning Stages have been found to be negligible. Therefore, an intra-project effect is unlikely.
Landscape Designations – Construction, Operation and Decommissioning Stages	All effects in relation to landscape designations are considered within <b>Chapter 12 - Landscape and Visual (Volume II)</b> . Therefore, the Landscape Assessment is scoped out of effect Intra-Project Effects Assessment.
Landscape and Visual Impact Assessment (LVIA) Assessment – Operation Year 15 effects	The year 15 operation effects considered within <b>Chapter 12 - Landscape and Visual (Volume II)</b> are excluded from the Intra-Project Effects Assessment as no other topics contain an assessment of operational year 15.
Material Usage – Construction, Operation and Decommissioning Stages	All intra-project effects in relation to material usage are considered within <b>Chapter 14 - Materials and Waste (Volume II)</b> .
Waste Generation – Construction, Operation and Decommissioning Stages	All intra-project effects in relation to waste generation are considered within <b>Chapter 14 - Materials and Waste (Volume II)</b> .
Noise and Vibration – Operation Stage	All residual effects in the <b>Chapter 15 - Noise and Vibration (Volume II)</b> Operation Stage have been found to be negligible (not significant) <sup>3</sup> . Therefore, an intra-project effect is unlikely.
Population and Human Health – Decommissioning Stage	Decommissioning Stage elements have been scoped out as the impacts on population and human health receptors at this stage are considered to be minimal and the associated effects, not significant. Therefore, an intra-project effect is unlikely.
Traffic and Transport – Operation Stage	The operation of the DCO Proposed Development will not result in significantly increased traffic flow or changes to

<sup>3</sup> In the Construction Stage all *Minor Adverse* effects are considered to be *not significant*.

Element Scoped Out	Justification
	traffic composition. Therefore, an intra-project effect is unlikely.
Traffic and Transport – Decommissioning Stage	Decommissioning activities are not anticipated to occur for a significant length of time, and it is not possible for Traffic and Transport baseline conditions to be robustly understood.
MA&D – Construction, Operation and Decommissioning Stages	MA&D is excluded from the assessment as a different assessment approach is used from the other <b>Technical Chapter (6-18, Volume II)</b> assessments within the ES. The vulnerability of the DCO Proposed Development to major events is assessed rather than effects on sensitive receptors. As a result, an Intra-Project Effects Assessment considering MA&D is not practicable.

## ELEMENTS SCOPED INTO THE ASSESSMENT

- 19.4.3. Elements scoped into the respective inter-project effects and intra-project effects assessments are discussed in Step 1 and Step 2 of the Inter-Project Effects Assessment (see **Appendix 19.1 - Inter-Project Effects Assessment, Volume III**) and Step A of the Intra-Project Effects Assessment (see **Appendix 19.2 - Intra-Project Effects Assessment, Volume III**). An explanation of the scoping processes for these assessments are discussed in **Section 19.5** below.

## 19.5. ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

### STUDY AREA

- 19.5.1. For the purposes of the Inter-Project Effects Assessment, the Study Area for the assessment has been determined following consideration of the likely significant effects that could reasonably arise from the other developments that have been considered alongside the DCO Proposed Development. The ZOI for each environmental topic is defined by relevant guidelines discussed in **Technical Chapters 6 – 18 (Volume II)** and is detailed in **Table 1 in Appendix 19.1 - Inter-Project Effects Assessment (Volume III)**. Other developments that fall within these ZOI have been considered on a case-by-case basis. The long-list of ‘other developments’ considered in the ZOI is contained in **Table 2 in Appendix 19.1 - Inter-Project Effects Assessment (Volume III)**. The short-list of ‘other developments’ for assessment is presented in **Table 3 in Appendix 19.1: Inter-Project Effects Assessment (Volume III)**.
- 19.5.2. For the purposes of the Inter-Project Effects Assessment and Intra-Project Effects Assessment, the Study Area conforms to those defined in **Technical Chapters 6 – 18 (Volume II)** for each respective environmental topic.

## METHOD OF BASELINE DATA COLLATION

- 19.5.3. The entirety of the assessment is desk-study based. Data and information have been collected from publicly available resources as well as consultation with the Cadent Gas Limited Cadent EIA Team and the Local Planning Authorities (LPA).

## IMPACT ASSESSMENT METHODOLOGY

### Inter-Project Effects

- 19.5.4. Advice Note 17 (**Ref. 19.1**) has been adopted for the DCO Proposed Development for the Inter-Project Effects Assessment. The approach within Advice Note 17 (**Ref. 19.1**) identifies a four-stage assessment process, summarised below in **Table 19.4**.

**Table 19.4 – Inter-Project Effects Assessment Methodology**

<b>Inter-Project Effects Assessment Stage</b>	<b>Main Activities</b>
<p><b>Stage 1</b> Establishing a Zone of Influence (ZOI) for the DCO Proposed Development and identifying a long-list of ‘other developments’.</p>	<p>A desk study was undertaken to establish the ZOI for each environmental topic scoped within the DCO Proposed Development. The ZOI analysis is documented in <b>Table 1</b> in <b>Appendix 19.1 - Inter-Project Effects Assessment (Volume III)</b>.</p> <p>A desk study was conducted of planning documents, development plan documents, and relevant development frameworks within the ZOI (applying professional judgement on a case-by-case basis) to identify a long-list of ‘other developments’ that are proposed within the ZOI. These developments progressed to Stage 2.</p> <p>The long-list is shown in <b>Table 2</b> in <b>Appendix 19.1 - Inter-Project Effects Assessment (Volume III)</b> and <b>Figure 19.1 - Other Developments (Volume IV)</b>.</p>
<p><b>Stage 2</b> Identify a short-list of ‘other developments’ for assessment.</p>	<p>The potential for significant inter-project effects of the developments in the long-list was assessed, applying exclusion/inclusion criteria.</p> <p>A shortlist of other developments was identified to take forward for full assessment (see <b>Table 3</b> in <b>Appendix 19.1 - Inter-Project Effects Assessment, Volume III</b>).</p> <p>Information identifying the key issues to be taken forward to Stage 3 and Stage 4 is documented within the assessment.</p>
<p><b>Stage 3</b> Information Gathering</p>	<p>Information regarding the shortlisted ‘other developments’ was gathered to inform the assessment.</p>

Inter-Project Effects Assessment Stage	Main Activities
<p><b>Stage 4</b> Assessment</p>	<p>A review of each of the 'other developments' has been undertaken to assess whether inter-project effects may arise.</p> <p>Any mitigation and enhancement measures have been identified in relation to any adverse inter-project effects. To identify suitable mitigation measures the apportionment of effects between the DCO Proposed Development and the 'other developments' was considered, and professional judgement used.</p> <p>Where required, monitoring measures have been identified to confirm that mitigation measures are working as intended, or to confirm effects where there was uncertainty.</p>

19.5.5. Other developments were categorised into tiers by the certainty associated with the development (such as if the development is already under construction or is in a pre-application stage). This approach is published within Advice Note 17 (Ref. 19.1) and reproduced in **Table 19.5** below.

**Table 19.5 – Inter-Project Effects Degree of Certainty**

Tier	Factors attributing to degree of certainty	Decreasing levels of detail likely to be available
Tier 1	<ul style="list-style-type: none"> <li>• Under construction;</li> <li>• Permitted application(s) but not yet under construction;</li> <li>• Submitted application(s) but not yet determined; and</li> <li>• Environmental Assessment equating to that of an EIA or extensive bespoke assessments on environmental topics.</li> </ul>	
Tier 2	<ul style="list-style-type: none"> <li>• Projects where an EIA Scoping Report or equivalent level environmental documentation in support of an application has been submitted.</li> </ul>	
Tier 3	<ul style="list-style-type: none"> <li>• Projects on the Planning Inspectorate / Developments of National Significance Register of Projects where an EIA Scoping Request has been made;</li> <li>• Local development plan allocations (adopted and emerging) with appropriate weight being given as they move closer to adoption); and</li> </ul>	

Tier	Factors attributing to degree of certainty	Decreasing levels of detail likely to be available
	<ul style="list-style-type: none"> <li data-bbox="501 284 1086 409">Identified in other plans and programmes (as appropriate) which set the framework for future development consents / approvals.</li> </ul>	

19.5.6. Any projects identified as under construction that are expected to be completed before construction of the DCO Proposed Development have been excluded from the assessment at Stage 2 (see **Table 2** in **Appendix 19.1 - Inter-Project Effects Assessment, Volume III**).

19.5.7. Refused planning applications that are not subject to appeal have not been considered as their implementation is not considered to be reasonably foreseeable.

19.5.8. The assessment considers the capacity of environmental resources and receptors to accommodate changes that are likely to occur. This includes the duration, extent, type (additive or synergistic), frequency, value and resilience of the receptor, and likely mitigation.

19.5.9. Further information about the four stages of the assessment, and how they have been followed for the DCO Proposed Development, are provided in the following sections.

#### Inter-Project Effects – Stage 1

19.5.10. Stage 1 of the approach outlined in Advice Note 17 requires the identification of a long-list of other developments and high-level information, such as the development location or the boundary of the application.

19.5.11. For individual environmental topics (see **Table 1** in **Appendix 19.1 - Inter-Project Effects Assessment, Volume III**), the ZOI is defined by the relevant institutional guidelines which are discussed within each respective technical chapter (**Technical Chapters 6-18, Volume II**). However, in determining a ZOI for other developments that could give rise to inter-project effects when interacting with the DCO Proposed Development it is necessary to consider each development on a case-by-case basis. The consideration of other developments at this stage relies on professional judgement. Developments within the ZOI vary in distance from the DCO Proposed Development, nature and scale and those determined as not having the potential for any inter-project effects from the DCO Proposed Development are not listed.

19.5.12. The developments on the long-list were evaluated to determine if they should be taken forward to the short-list of other developments for each individual environmental topic. Considerations included the temporal scope (construction and operation programmes of other developments), as well as whether there

are any shared receptors or pathways for inter-project effects, to establish whether there is overlap and any potential for interaction.

- 19.5.13. The developments were assessed for inclusion within the long-list and short-list on a case-by-case basis and professional judgement was used.
- 19.5.14. The following criteria were applied when determining the long-list:
- Are within the maximum ZOI for the DCO Proposed Development (10km). This extends to the area of Flintshire County Council, Denbighshire County Council, and Chester West and Chester Council;
  - Have been identified for consideration by the Applicant;
  - Have been identified for consideration by LPAs and other stakeholders in the Scoping Opinion (as published by The Inspectorate); or
  - Developments were of a size to be considered having the potential to result in an inter-project effect. For the case of the DCO Proposed Development, developments equal to or smaller than 10 residential units (or an equivalent size) were excluded from the long-list.
- 19.5.15. As noted in **Chapter 1 - Introduction** and **Chapter 2 - The Project (Volume II)**, the DCO Proposed Development forms part of the Project. The Project will include other components (for example Hydrogen Production Plants) which, at the time of completing the Inter-Project Effects Assessment, are at different stages of development and will be seeking separate consents by the appropriate routes. This will include consideration of any relevant works within the marine environment associated with the Project.

#### Inter-Project Effects – Stage 2

- 19.5.16. Following this data collection, the long-list has been refined to a short-list by reviewing each of the other developments identified against the following criteria:
- Would the Construction or Operation Stage overlap with the DCO Proposed Development?
  - Is there potential that the DCO Proposed Development shares common sensitive Receptors with the other development?
  - The other development has environmental assessment information that is publicly available and is sufficient to allow the identified receptors and residual effects of the other development to be understood. Other developments that have no, or insufficient environmental assessment information, will typically not be considered as it will not be possible to accurately identify common receptors or inter-projects effects with the DCO Proposed Development.
- 19.5.17. Professional judgement has been applied to develop the above criteria. It is not anticipated that other developments outside of the criteria set out above would give rise to cumulatively greater or materially different likely significant effects with the DCO Proposed Development considering its scale and nature.

However, professional judgement may be applied to support the exclusion of other developments which exceed the thresholds, but which may not give rise to discernible inter-project effects on receptors, and vice versa. The reasons for including or excluding each of the other developments is clearly stated.

#### Inter-Project Effects – Stage 3 and 4

- 19.5.18. Information on other developments included within the short-list has been gathered from available third-party information sources within the public domain. This information has included, where available, reported environmental effects, design, location, construction programme (including demolition), and operational activities.
- 19.5.19. The assessment of the inter-project effects is based on the residual effects identified in the **Technical Chapters 6 – 18 (Volume II)**, as well as available environmental information for the approved developments. This step corresponds with Stage 4 of Advice Note 17 (**Ref. 19.1**).
- 19.5.20. For each shortlisted development, the residual effects stated in each technical chapter on identified shared receptors or resources are detailed in the assessment table. The inter-project effects assessment table also presents the effects on the shared receptors or resources from each shortlisted development, obtained from third-party information where available. Where information on effects from shortlisted developments has not been available, professional judgement has been used to identify the potential for significant inter-project effects.
- 19.5.21. The qualitative evaluation at the receptor level considered the following:
- Combined magnitude of change;
  - Sensitivity / value / importance of the receptor / receiving environment to change; or / and
  - Duration and reversibility of effect.
- 19.5.22. Through a combination of evaluating the residual effects presented in the technical chapters of the ES, and the environmental information available for the other development, conclusions have been drawn as to the likelihood for significant inter-project effects.

#### Intra-Project Effects

- 19.5.23. Some environmental topics interact with each other, for example, changes in air quality, road traffic noise, and visual impact. Therefore, several effects on a receptor or resource shared by these environmental topics hypothetically could interact to produce a combined effect of overall greater significance than each individual effect on its own.
- 19.5.24. The reported residual effects on receptors and resources within each of the technical chapters have been carried through to this Intra-Project Effects Assessment. The assessment considers intra-project effects at the

Construction, Operation and Decommissioning Stages of the DCO Proposed Development. Where more than one residual effect on a receptor or resource has been identified the Intra-Project Effects Assessment has considered the potential for intra-project effects of greater significance than each individual effect considered separately. Where intra-project effects of greater significance have been identified, consideration has been given to the need for additional mitigation measures.

19.5.25. This assessment considers any residual effects that are reported as major, moderate or minor within separate technical chapters. Minor effects, while not significant, are considered in the assessment on the basis that multiple minor effects may interact to result in a significant effect. Negligible residual effects reported in the separate technical chapters are considered unlikely to accumulate to the extent that a significant intra-project effect would occur.

19.5.26. The assessment of intra-project effects has been undertaken in three steps. These steps have been taken for the assessment of both the Construction and Operation Stages:

- **Step A:** Identification of receptors or resources considered in more than one technical chapter, and therefore having the potential to be affected by more than one environmental topic. It is during this step that exclusions have been identified to avoid overlap with information reported in technical chapters, as discussed in **Section 19.4**;
- **Step B:** For receptors or resources identified in Step A, the significance of the residual effect from each relevant technical chapter have been identified; and
- **Step C:** For receptors or resources identified in Step B, consideration has been given to whether there would be an intra-project effect and if so whether that effect would be of the same or greater significance than the component effects.

## **SIGNIFICANCE CRITERIA**

### **Inter-Project Effects**

19.5.27. The Inter-Project Effects Assessment considers the potential for significant residual inter-project effects with any required mitigation in place, see **Table 19.6**. The significance of the effect is formulated as a function of a receptor or a resource's environmental value/sensitivity and the magnitude of the impact of the DCO Proposed Development. Advice Note 17 (**Ref. 19.1**) states:

*“The significance criteria used to assess likely cumulative effects should consider the capacity of environmental resources and receptors to accommodate changes that are likely to occur. The terminology used to determine significance should be explicit and ensure a clear understanding of the outcome of the CEA”.*

19.5.28. The significance of inter-project effects has been determined using the significance criteria outlined in **Section 5.11 of Chapter 5 - EIA Methodology (Volume II)**, where full details of the significance process can be found. The significance criteria classifications are outlined in the table below.

**Table 19.6 – Inter-Project Effects Significance Criteria**

Significance Category	Definition of Effect
Major	Adverse or Beneficial effects that are considered to be very important considerations as significant magnification of effects on receptors/resources that are already predicted to occur.
Moderate	Adverse or Beneficial effects that are unlikely to become issues, but where future work may be needed to improve on current performance as a significant magnification of effects on receptors/resources are likely to occur.
Minor	Adverse or Beneficial Effects that are locally significant and in the case of inter-project effects would be unlikely to lead to a significant magnification of effects on a receptor/resource.
Negligible	No effects or effects that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

**Intra-Project Effects**

19.5.29. The significance of intra-project effects has been determined by considering the following factors:

- Which receptors or resources are affected by more than one environmental topic; and
- How the DCO Proposed Development affects the condition of the receptor or resource, using information contained within each technical chapter.

19.5.30. The significance of intra-project effects has been determined using the significance criteria outlined in **Section 5.11 of Chapter 5 - EIA Methodology (Volume II)**. Full details of the significance process can be found there. The significance criteria classifications are outlined in the table below.

**Table 19.7 – Intra-Project Effects Significance Criteria**

Significance Category	Definition of Effect
Major	Adverse or Beneficial effects that are considered to be very important considerations as significant magnification of effects on receptors/resources that are already predicted to occur.
Moderate	Adverse or Beneficial effects that are unlikely to become issues, but where future work may be needed to improve on current performance as a significant magnification of effects on receptors/resources are likely to occur.
Minor	These beneficial or adverse effects may be raised as local factors and in the case of intra-project effects would not lead

Significance Category	Definition of Effect
	to a significant magnification of effects on a receptor/resource.
Negligible	No effects or effects that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

## ASSUMPTIONS AND LIMITATIONS

### Inter-Project Effects

- 19.5.31. The assessment of inter-project effects will be based on the interpretation and assessment of publicly available data and limited by the level of information available.
- 19.5.32. There are cases that other development(s) is/are screened into the short-list which have environmental information available for some or most topics, but not for others. In such instances, the Inter-Project Effects Assessment for the given other development(s) may be limited to only those topics which have environmental information on which to assess. However, in such cases efforts will be made, where possible, for the topics lacking environmental information to make an assessment based on assumptions. The assumptions are stated within the assessment.
- 19.5.33. Although environmental information may be available for other development(s), it may be limited in its compatibility where different assessment methodologies or criteria have been used. Where a lack of information limits or prevents the Inter-Project Effects Assessment, this has been stated.
- 19.5.34. For the purpose of the assessment, professional judgement using a reasonable worst case scenario has been used when there is a lack of certainty about a given other development.
- 19.5.35. In the absence of information and assessments of other development(s) for some topics, it is assumed that the developer would implement standard practice mitigation measures to reduce the effect of the 'other development'.

### Intra-Project Effects

- 19.5.36. The assessment of effects interactions resulting from the DCO Proposed Development will be focused on the residual effects from the construction, operation and decommissioning stages following the implementation of mitigation measures, with exceptions for certain environmental topics (see **Table 19.3**).

## 19.6. BASELINE CONDITIONS

19.6.1. The assessment of cumulative effects does not include a bespoke analysis of baseline conditions, this information is instead drawn from **Technical Chapters 6 – 18 (Volume II)**.

### EXISTING BASELINE

19.6.2. Details on the existing baseline relevant to the assessment of inter-project effects or intra-project effects can be found in the relevant environmental topic chapter (see **Technical Chapters 6 – 18, Volume II**) for the receptors in question.

### FUTURE BASELINE

19.6.3. The Inter-Project Effects Assessment presents future baseline conditions as part of the assessment process.

19.6.4. A future baseline assessment has not been carried out for the Intra-Project Effects Assessment.

## 19.7. SENSITIVE RECEPTORS

19.7.1. The following sensitive receptors/resources have been assessed for the Inter-Project Effects Assessment:

- The DCO Proposed Development;
- Above ground heritage assets;
- Protected ecological areas and ecological receptors (habitats and species);
- Residential receptors (residents and residential properties);
- Recreational areas and PRow (and their users);
- Non-Residential properties (and their users);
- Surface water bodies, controlled waters and groundwater;
- Mineral resources and soil quality;
- Human health; and
- Visual amenity and Landscape Character Areas.

19.7.2. The Intra-Project Effects Assessment assesses the following sensitive receptors/resources, which have been identified as ‘common receptors’ as described in **Table 19.4**, as per the process and exclusions outlined in **Section 19.5** and detailed in **Appendix 19.2 - Intra-Project Effects Assessment (Volume III)**:

- Residential receptors (residents and residential properties);
- Recreational areas and PRow (and their users); and
- Non-Residential properties (and their users).

## 19.8. ASSESSMENT OF LIKELY IMPACTS AND EFFECTS

19.8.1. This section summarises the outcomes of the inter-project and intra-project effects assessments. Full details on the assessment and the residual effect outcomes can be found in **Appendix 19.1 - Inter-Project Effects Assessment (Volume III)** and **Appendix 19.2 - Intra-Project Effects Assessment (Volume III)**.

### INTER-PROJECT EFFECTS

#### Construction Stage

19.8.2. The Inter-Project Effects Assessment for the Construction Stage assessed the potential for inter-project effects for the following topics:

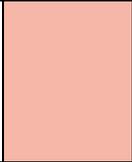
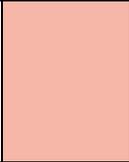
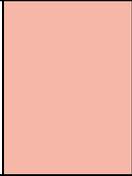
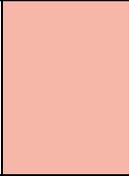
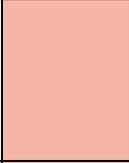
- Biodiversity;
- Land and Soils;
- Landscape and Visual;
- Materials and Waste;
- Noise and Vibration;
- Population and Human Health;
- Traffic and Transport; and
- Water Resources and Flood Risk.

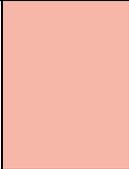
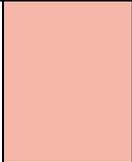
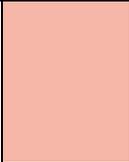
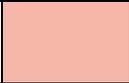
19.8.3. Of the topics reporting residual inter-project effects for short-listed 'other developments', only Landscape and Visual reported a **Moderate Adverse (significant)** residual effect (associated with the A55 Red Route – 'other Development 14'). All other effects for the Construction Stage were appraised to be either *Minor Adverse* or *Negligible (not significant)*.

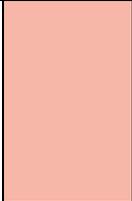
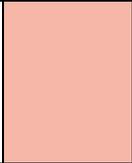
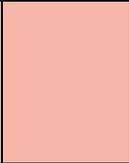
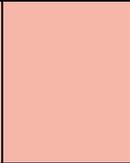
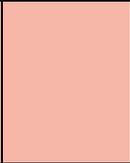
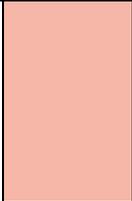
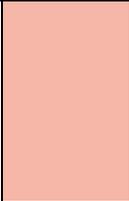
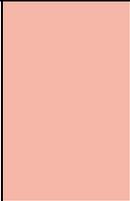
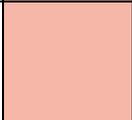
19.8.4. **Table 19.8** overleaf provides an overview of the inter-project effects identified during construction, for each of the environmental topics. Refer to **Appendix 19.1 (Volume III)** for further details on the nature of these effects and a full description of the proposed 'other developments'.

**Table 19.8 – Overall Inter-Project effects - Construction Stage**

<p><b>Other Development</b></p> <p>Significance</p> <p>Moderate Adverse</p> <p>Minor Adverse</p> <p>Key to Effect</p> 	Biodiversity	Land and Soils	Landscape and Visual	Materials and Waste	Noise and Vibration	Population and Human Health	Traffic and Transport	Water Resources and Flood Risk
1a - Hynet CO2 Pipeline TCPA (Two Applications) - Point of Ayr (PoA) Terminal and Foreshore Works and HyNet Carbon Dioxide Pipeline BVS Site	Minor Adverse			Minor Adverse				
1c - Hynet - PoA Electricity Capacity Upgrade	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse
1d - Hynet – BVS and AGI Electrical Connectivity and Fibre Optic Connections		Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse
1ei - CWCC Reference: 21/04091/FUL: Hynet - Vertex Hydrogen Production Plant	Minor Adverse			Minor Adverse	Minor Adverse	Minor Adverse		Minor Adverse
1f - Hynet – Hydrogen Production Plant (HPP) – Natural Gas Pipeline	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse
1g - NSIP – Planning Inspectorate Reference: Hynet North West Hydrogen Pipeline	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	
5 - FCC Ref. 062255: Demolition and erection of new poultry buildings and associated infrastructure							Minor Adverse	
9 - FCC Reference: 063496: Demolition of the existing Argoed High School buildings and provision of a new Net Zero Carbon in operation school campus				Minor Adverse				Minor Adverse
14 - A55 Red Route	Minor Adverse	Minor Adverse	Moderate Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse	Minor Adverse
21 - CWCC Reference: 19/04561/OUT: Development of up to 500,000sqft (46,450m2) of B2/B8 use class floorspace, with ancillary offices.				Minor Adverse				

<p><b>Other Development</b></p> <p>Significance      Key to Effect</p> <p>Moderate Adverse      </p> <p>Minor Adverse      </p>	Biodiversity	Land and Soils	Landscape and Visual	Materials and Waste	Noise and Vibration	Population and Human Health	Traffic and Transport	Water Resources and Flood Risk
22 - CWCC Reference: 19/03045/FUL: Erection of two industrial units for B1, B2 and B8								
24 - CWCC Reference: 22/01679/S73: Part A - (full permission) for phased development of 483 dwellings and associated infrastructure. Part B - (outline permission - all matters reserved apart from access) for a local centre.								
27 - FCC Ref: 050125: Employment-led mixed-use development, incorporating Logistics and Technology Park (B1, B2, B8) with residential(C3), local retail centre (A1), hotel (C1), training and skills centre (C2, D1) and new parkland.								
35 - CWCC Reference: 20/04152/REM: Erection of 142 dwellings, landscaping, public open space, internal access roads, garages, car parking, pumping stations and associated infrastructure.								
37 - CWCC Reference: 20/02712/OUT: Erection of up to 150 dwellings and demolition of nos. 272, 274, 276 and 278 Sealand Road with all matters reserved except access.								
38 - CWCC Reference: 20/01124/REM: Residential development of up to 190 dwellings with access and associated works (Phase 5 B Rossfield Park).								

<p><b>Other Development</b></p> <p>Significance      Key to Effect</p> <p>Moderate Adverse      </p> <p>Minor Adverse      </p>	Biodiversity	Land and Soils	Landscape and Visual	Materials and Waste	Noise and Vibration	Population and Human Health	Traffic and Transport	Water Resources and Flood Risk
42 - FCC Reference: 062458: Residential development of up to 140 dwellings, means of access, open space, sustainable drainage infrastructure and all other associated works (outline application including access, with all other matters reserved).								
44 - CWCC Reference: 19/04504/REM: Reserved matters application for 313 dwellings forming part of phases 4 and 5 and associated infrastructure and open space								
45 - CWCC Reference: 19/04389/REM: Reserved Matters application for 256 dwellings forming part of Phase 3 of the development, alongside associated infrastructure and open space								
54 - CWCC Reference: 21/04076/FUL: Materials recycling facility, two plastics recycling facilities, a polymer laminate recycling facility and a hydrogen refuelling station.								
63 - CWCC Reference: 20/04396/FUL: Resource recovery facility (Plastics Recycling Facility).								
70 - CWCC Reference: 19/02298/OUT: Redevelopment of the racecourse land for a new Events Building with undercroft parking area, Pavilion Grandstand and associated works with the retention of car park at Saddlery Way for permanent use as car park.								

<p><b>Other Development</b></p> <p>Significance      Key to Effect</p> <p>Moderate Adverse      </p> <p>Minor Adverse      </p>	Biodiversity	Land and Soils	Landscape and Visual	Materials and Waste	Noise and Vibration	Population and Human Health	Traffic and Transport	Water Resources and Flood Risk
82 - FCC Reference: 059663: Repair and refurbishment of vacant historic (listed) former hospital buildings, with associated new build houses/apartments to create a total of 89 dwellings.								
108 - FCC Reference: 058314: An outline permission for residential development of up to 145 dwellings (Use Class C3) and associated works including highways access.								
109 - FCC Reference: 062820: Erection of 130 dwellings comprising bungalows, houses and two storey apartments with own access, new access road, associated external works and landscaping.								
120 - FCC Reference: 049320: Outline application for the redevelopment of a strategic brownfield site for an employment led mixed use development with new accesses and associated infrastructure including flood defences and landscaping.								
121 - FCC Reference: 061507: Outline application for approval in principle for residential development (up to 94 dwellings), all matters reserved except for access.								

<p><b>Other Development</b></p> <p><b>Significance</b></p> <p>Moderate Adverse</p> <p>Minor Adverse</p> <p><b>Key to Effect</b></p> 	Biodiversity	Land and Soils	Landscape and Visual	Materials and Waste	Noise and Vibration	Population and Human Health	Traffic and Transport	Water Resources and Flood Risk
<p>124 - FCC Reference: 061994: Erection of residential development comprising of a variety of one-, two-, three- and four-bedroom homes (approximately 160 units), together with associated public open space and infrastructure.</p>								

### **Operation Stage**

- 19.8.5. The Inter-Project Effects Assessment for the Operation Stage assessed the potential for inter-project effects for the following topics:
- Climate Resilience;
  - Cultural Heritage;
  - Landscape and Visual;
  - Population and Human Health; and
  - Water Resources and Flood Risk.
- 19.8.6. Of the topics reporting residual inter-project effects for short-listed developments, all effects for the Operation Stage were appraised to be either *Minor Adverse or Negligible (not significant)*. The majority of the effects were found to be *Negligible*.
- 19.8.7. As well as this, the overall inter-project effects for the environmental topic were appraised to be either *Minor Adverse* (Climate Resilience, Landscape and Visual and Water Resources and Flood Risk) or *Negligible* (Cultural Heritage and Population and Human Health).
- 19.8.8. **Table 19.9** overleaf provides an overview of the inter-project effects identified during operation, for each of the environmental topics. Refer to **Appendix 19.1 (Volume III)** for further details on the nature of these effects and a full description of the proposed other developments.

**Table 19.9 – Overall Inter-Project effects- Operation Stage**

<p><b>Other Development</b></p> <p>Significance</p> <p>Moderate Adverse</p> <p>Minor Adverse</p> <p>Key to Effect</p> 	Climate Resilience	Cultural Heritage	Landscape and Visual	Population and Human Health	Water Resources and Flood Risk
1c - Hynet - PoA Electricity Capacity Upgrade					
1d - Hynet – BVS and AGI Electrical Connectivity and Fibre Optic Connections					
1ei - Hynet - Vertex Hydrogen Production Plant					
1f - Hynet – Hydrogen Production Plant (HPP) – Natural Gas Pipeline					
1g - NSIP – Planning Inspectorate Reference: Hynet North West Hydrogen Pipeline					
9 - FCC Reference: 063496: Demolition of the existing Argoed High School buildings and provision of a new Net Zero Carbon in operation school campus					
14 - A55 Red Route					
27 - FCC Ref: 050125: Employment-led mixed-use development, incorporating Logistics and Technology Park (B1, B2, B8) with residential(C3), local retail centre (A1), hotel (C1), training and skills centre (C2, D1) and new parkland.					
109 - FCC Reference: 062820: Erection of 130 dwellings comprising bungalows, houses and two storey apartments with own access, new access road, associated external works and landscaping.					

## INTRA-PROJECT EFFECTS

### Construction Stage

- 19.8.9. The following common receptors were identified in the Construction Stage as having the potential for intra-project effects:
- Residential receptors (residents and residential properties);
  - Recreational areas and PRoW (and their users); and
  - Non-residential properties (and their users).
- 19.8.10. Residential receptors are anticipated to see *Minor Adverse (not significant)* intra-project effects at Sections 3, 4 and 7 of the DCO Proposed Development due to the interactions of effects of visual, noise, traffic and water impacts (as reported in **Chapter 12 - Landscape and Visual, Chapter 15 - Noise and Vibration, Chapter 16 - Population and Human Health, Chapter 17 - Traffic and Transport and Chapter 18 - Water Resources and Flood Risk (Volume II)**). Intra-project effects at Sections 1, 2, 5 and 6 of the DCO Proposed Development were found to be *Negligible (not significant)*.
- 19.8.11. Recreational Areas and PRoW are anticipated to see *Negligible (not significant)* intra-project effects from the interactions of effects reported in **Chapter 12 - Landscape and Visual and Chapter 16 - Population and Human Health (Volume II)**.
- 19.8.12. Non-residential Properties are anticipated to see *Minor Adverse (not significant)* intra-project effects at Sections 3, 4 and 5 of the DCO Proposed Development due to the interactions of effects reported in **Chapter 15 - Noise and Vibration, Chapter 16 - Population and Human Health and Chapter 17 - Traffic and Transport (Volume II)**. Intra-project effects at Sections 1 and 2 of the DCO Proposed Development were found to be *Negligible (not significant)*, and no intra-project effects were identified at Sections 6 or 7.

### Operation Stage

- 19.8.13. No common receptors have been identified for the Operation Stage, so there will be no intra-project effects at this Stage.

### Decommissioning Stage

- 19.8.14. The only common receptors identified in the Decommissioning Stage as having the potential for intra-project effects are residential receptors (residents and residential properties).
- 19.8.15. Residential receptors are anticipated to see *Minor Adverse (not significant)* intra-project effects at Section 7 of the DCO Proposed Development due to the interactions of effects of visual and noise impacts (as reported in **Chapter 12 - Landscape and Visual and Chapter 15 - Noise and Vibration (Volume II)**). No intra-project effects were identified at Sections 1-6.

## 19.9. MITIGATION AND ENHANCEMENT MEASURES

- 19.9.1. This section sets out the preliminary proposed avoidance, mitigation and compensation measures which are likely to be required to address the significant effects as assessed in **Section 16.8** above.
- 19.9.2. As stated above, only Landscape and Visual reported significant effects that require mitigation, in relation to 'Other Development 14'.
- 19.9.3. It is therefore suggested that the Applicant will continue to engage with the developer of A55 Red Route ('Other Development 14') and develop an appropriate mitigation strategy, should construction occur simultaneously, to avoid significant temporary inter-project effects. The effects arise from simultaneous construction within the Estuary Edge and Valleys (LCA). If simultaneous construction within the LCA can be avoided, no significant inter-project effect will occur, and no mitigation is considered to be required.

## 19.10. RESIDUAL EFFECTS

- 19.10.1. With the application of the mitigation measure set out in **Section 19.9**, should construction occur simultaneously, the ***moderate adverse (significant)*** effect on Landscape and Visual from 'Other Development 14', would be reduced to ***minor adverse (not significant)***.

## 19.11. MONITORING

- 19.11.1. The assessment has not identified the need for any additional monitoring requirements beyond that stated in **Technical Chapters 6 – 18 (Volume II)**.

## 19.12. REFERENCES

- **Ref. 19.1:** The Planning Inspectorate (2015). Advice Note 17: Cumulative Effects Assessment.
- **Ref. 19.2:** The Environmental Impact Assessment Directive (85/337/EEC) 2009 (as amended).
- **Ref. 19.3:** The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
- **Ref. 19.4:** The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017.
- **Ref. 19.5:** The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.
- **Ref. 19.6:** Design Manual for Roads and Bridges, Volume 11, Section 5 Assessment and Management of Environmental Effects (HA 205/08) 2008.
- **Ref. 19.7:** Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework.

- **Ref. 19.8:** Department of Energy and Climate Change (2011) Overarching National Policy Statement for Energy (EN-1).
- **Ref. 19.9:** The Planning Inspectorate (2018) Advice Note 9: The Rochdale Envelope (Version 3).