



Preliminary Environmental Information Report

Appendix 18A: Effect Interactions Matrix

PEIR Appendices [PINS Ref: EN010171]

Document Reference: EN 010171/PEIR APP/18A

Revision Number: 1

December 2025

Future Energy Llanwern Limited

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18.0 Effect Interactions Matrix

18.1 Introduction

- 18.1.1 This Appendix presents the assessment of the likely significant effects of the Proposed Development with respect to combined effects (also referred to as 'intra-project' or 'inter-related' cumulative effects). It should be read in conjunction with the description provided in **Chapter 2: Description of the Proposed Development** of the Preliminary Environmental Information Report (PEIR).
- 18.1.2 Potential cumulative effects arising from the combination of effects from the Proposed Development with similar topic-related effects generated by other developments (also referred to as 'inter-project' cumulative effects) are discussed in **Chapter 5: Environmental Impact Assessment Methodology** and assessed in **Chapters 6 to 17**.
- 18.1.3 Residual effects (those that remain after mitigation is implemented) upon receptors have been identified throughout the PEIR technical chapters (see: **Chapters 6 to 17**). This Appendix cross-references these effects to identify where a receptor is affected by more than one impact, so that the possible effect interactions can be assessed (see: **Chapter 18: Cumulative Effects and Interactions**).
- 18.1.4 The receptors that have been assessed in more than one topic chapter have been collated into **Table 18A-1** below.

Table 18A-1 Common Receptors

	Greenhouse Gas	Cultural Heritage	Ecology	Ornithology	Water Environment	Landscape and Visual Impact Assessment	Glint & Glare	Noise and Vibration	Socio-economics, Tourism and Recreation	Transport and Access	Ground Conditions	Other Environmental Topics
Ecological Receptor												
Severn Estuary Ramsar/ SAC/ SSSI			X	X	X							
Magor Marsh SSSI			X	X	X				X			
Newport Wetlands SSSI/ National Nature Reserve (NNR)			X	X					X			
Newport Wetland NNR				X					X			
Historic Landscape Character Areas: Redwick HLCA06, Redwick Broadmead HLCA007, Northern Redwick HLCA008, Porton HLCA004, Major Lower Grange HLCA010, Whitson Black-fen HLCA002, Whitson Black-fen HLCA002, Whitson HLCA003		X				X						

	Greenhouse Gas	Cultural Heritage	Ecology	Ornithology	Water Environment	Landscape and Visual Impact Assessment	Glint & Glare	Noise and Vibration	Socio-economics, Tourism and Recreation	Transport and Access	Ground Conditions	Other Environmental Topics
Ordinary Wet reens / ditches			X		X							
Landscape/Visual and Environment Receptors												
Historic Landscape Character Areas: Redwick HLCA06, Redwick Broadmead HLCA007, Northern Redwick HLCA008, Porton HLCA004, Major Lower Grange HLCA010, Whitson Black-fen HLCA002, Whitson Black-fen HLCA002 ,Whitson HLCA003		X				X						
Wales Coast Path						X		X	X			
National Cycle Network Route 4						X			X			
Redwick Circular Route						X			X			
Non-named reens/ditches/ordinary watercourses and ditches			X			X						

	Greenhouse Gas	Cultural Heritage	Ecology	Ornithology	Water Environment	Landscape and Visual Impact Assessment	Glint & Glare	Noise and Vibration	Socio-economics, Tourism and Recreation	Transport and Access	Ground Conditions	Other Environmental Topics
Green Lanes						X		X				
PRoW (372/56/1, 372/54/3, 372/58/3,5,1,7, 392/15A/1, 372/59/1, 372/59A/1)						X		X	X			
Local transport routes						X	X			X		
Residential Receptors												
Porton House (part of Whiston but affected differently) R04						X	X	X				
Whitson and outlying properties to the south of Whitson and south-west of the Proposed Development (excluding Porton house/rd						X	X	X				
Outlying properties to the north of the Proposed Development (this includes Cock Street, Grangefield,						X		X				

	Greenhouse Gas	Cultural Heritage	Ecology	Ornithology	Water Environment	Landscape and Visual Impact Assessment	Glint & Glare	Noise and Vibration	Socio-economics, Tourism and Recreation	Transport and Access	Ground Conditions	Other Environmental Topics
Greenfield House, and properties along North Row);												
Redwick and outlying residential property to the south of the hamlet (Green Street, South Row and Mead Lane (including Mead Farm, Great House); excluding Church Farm R15 / R17						X	X	X				
Church Farm R20						X	X	X				
Summerlease and outlying residential property surrounding the east of the Proposed Development along Pill Street, Whitwall, (including Summerlease Farm, Lower Grange, Magorpill Farm, Pill Farm, Chapel Farm and Pennycloud); excluding chapel farm and Cherry Tree House						X	X	X				

	Greenhouse Gas	Cultural Heritage	Ecology	Ornithology	Water Environment	Landscape and Visual Impact Assessment	Glint & Glare	Noise and Vibration	Socio-economics, Tourism and Recreation	Transport and Access	Ground Conditions	Other Environmental Topics
Chapel Farm and Cherry Tree House						X		X				
Greenfield R19						X		X				
The Summer House						X		X				
Associated residential property that forms Pill Farm R17						X		X				
Houses along and around N Row						X	X					
Houses in and around Undy village, along W End and Church Rd						X	X					

18.1.5 The receptors with the potential for combined effects, as they have been assessed by more than one topic chapter, are as follows:

- **Ecological Receptors**

- Severn Estuary Ramsar/ SAC/ SSSI (Ecology, Ornithology, Water Environment);
- Magor Marsh SSSI (Ecology, Ornithology, Water Environment);
- Newport Wetlands SSSI/ NNR (Ecology, Ornithology);
- Newport Wetland NNR (Ornithology, Socio-economics, Tourism and Recreation); and
- Ordinary Wet reens / ditches (Ecology, Water Environment).

- **Landscape/Visual and Environment Receptors**

- Historic Landscape Character
Areas: Redwick HLCA06, Redwick Broadmead HLCA007, Northern Redwick HLCA008, Porton HLCA004, Major Lower Grange HLCA010, Whitson Black-fen HLCA002, Whitson Black-fen HLCA002, Whitson HLCA003 (Cultural Heritage, Landscape and Visual Impact Assessment (LVIA));
- Wales Coastal Path (LVIA, Socio-economics, Tourism and Recreation, Noise and Vibration);
- National Cycle Network Route Network 4 (LVIA, Socio-economics, Tourism and Recreation);
- Redwick Circular Route (LVIA, Socio-economics, Tourism and Recreation);
- Non-named reens/ditches/ordinary watercourses and ditches (Ecology and LVIA);
- Green Lanes (LVIA, Socio-economics, Tourism and Recreation);
- PRoW (372/56/1, 372/54/3, 372/58/3,5,1,7, 392/15A/1, 372/59/1, 372/59A/1) (LVIA, Socio-economics, Tourism and Recreation, Noise & Vibration); and
- Local transport routes (LVIA, Glint & Glare, Transport and Access).

- **Residential Receptors**

- Porton House (part of Whiston but affected differently) (LVIA, Glint and Glare, Noise and Vibration);

- Whitson and outlying properties to the south of Whitson and south-west of the Proposed Development (excluding Porton house/rd) (LVIA, Glint and Glare, Noise and Vibration);
- Outlying properties to the north of the Proposed Development (this includes Cock Street, Grangefield, Greenfield House, and properties along North Row); (LVIA, Noise and Vibration);
- Redwick and outlying residential property to the south of the hamlet (Green Street, South Row and Mead Lane (including Mead Farm, Great House); excluding Church Farm (LVIA, Glint & Glare, Noise and Vibration);
- Church Farm (LVIA, Glint and Glare, Noise and Vibration);
- Summerleaze and outlying residential property surrounding the east of the Proposed Development along Pill Street, Whitwall, (including Summerleaze Farm, Lower Grange, Magorpill Farm, Pill Farm, Chapel Farm and Pennycloud); excluding chapel farm and Cherry Tree House (LVIA, Glint & Glare, Noise & Vibration);
- Chapel Farm and Cherry Tree House (LVIA, Noise and Vibration);
- Greenfield (LVIA, Noise and Vibration);
- The Summer House (LVIA, Noise and Vibration);
- Associated residential property that forms Pill Farm (LVIA, Noise and Vibration);
- Houses along and around N Row (LVIA, Glint and Glare); and
- Houses in and around Undy village, along W End and Church Rd (LVIA and Glint and Glare).

Likely Significant Effects

18.1.6 The purpose of EIA is to identify and assess any likely significant effects that are material to the decision-making process. In order to maintain proportionality, and in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 18A-1), this assessment therefore concentrates on where significant combined effects are likely to arise between topics considered in this PEIR.

18.2 Assessment Methodology

18.2.1 National policy guidance requires that all relevant effects should be considered

objectively. However, existing policy guidance presently fails to provide advice on how such an objective assessment should be carried out.

- 18.2.2 There is no established, robust methodology for quantitatively assessing complex cross-topic inter-related effects and assigning a level of significance to them, as methodologies and criteria vary across environmental aspects. Therefore, the assessment of inter-related effects between topics is qualitative, relying on professional judgement as to how individual effects would interact.
- 18.2.3 The methodology adopted for this assessment is summarised in **Plate 18A-1** and is outlined in detail in the remainder of this Section.

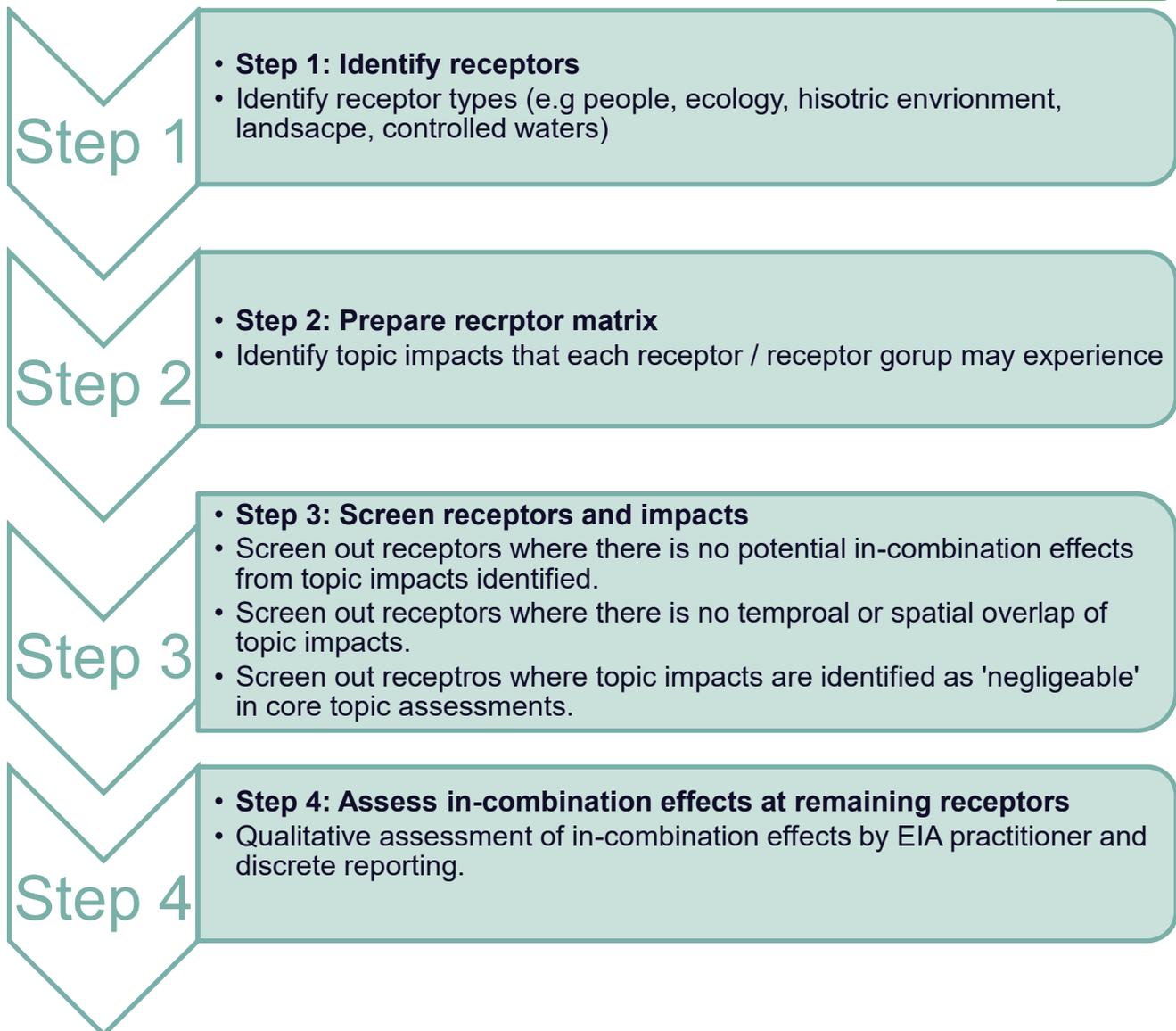


Plate 18A-1 Illustrative example of the spatial scope and Study Area of an example receptor.

18.2.4 Common receptors for environmental topics have been identified and consideration given to whether the aspect effects on any common receptors are likely to combine.

This has identified:

- The common receptor(s) from the individual topic assessments;
- The impact source pathways that can affect the common receptor(s);
- The potential effects on the identified common receptor(s); and
- The inter-related effects across the construction, operation and maintenance and decommissioning phases where appropriate.

18.2.5 It should be noted that some elements of the assessment inherently consider inter-related effects.

18.2.6 For example, biodiversity assessment of effects takes into account the potential for multiple impacts affecting particular features such as disturbance effects on faunal receptors resulting from noise and vibration, visual disturbance and lighting. Where this is the case, this is described within the individual environmental topic chapter (**Chapters 6 to 17**).

18.3 Assessment of Combined Effects

Overview

18.3.1 The assessment of inter-related cumulative effects has focused on those receptors where potential significant effects have been predicted in respect of at least two or more topics and/or where the technical assessments have shown that potential individual effects are nearing the thresholds of established national criteria.

18.3.2 Table 18A-3 sets out where potential effect interactions have been identified across all phases of the Proposed Development. It should be noted that the inter-related effects identified across the construction, operational and decommissioning phases of the Proposed Development were identical and have therefore been reflected in one table.

18.3.3 **Table 18A-2** sets out the key underpinning **Table 18A-3**.

Table 18A-2 Key

Symbol	Meaning
◆◆	Significant effect identified
	There is potential for an effect interaction.
X	Either no effect has been identified or an identified effect is negligible.

Table 18A-3 Potential for Combined Effects during Construction, Operational and Decommissioning Phases

	Greenhouse Gas	Cultural Heritage	Ecology	Ornithology	Water Environment	L VIA	Glint & Glare	Noise and Vibration	Socio-economics, Tourism and Recreation	Transport and Access	Ground Conditions	Other
Wales Coast Path	X	X	X	X	X	◆◆	X	X	◆◆	X	X	X
National Cycle Network Route Network 4	X	X	X	X	X	◆◆	X	X	◆◆	X	X	X
Redwick Circular Route	X	X	X	X	X	◆◆	X	X	◆◆	X	X	X
PRoW (372/56/1, 372/54/3, 372/58/3,5,1,7, 392/15A/1, 372/59/1, 372/59A/1)	X	X	X	X	X	◆◆	X	X	◆◆	X	X	X

18.4 Preliminary Assessment

18.4.1 The technical assessments (**Chapters 6 to 17**) in the PEIR have identified potential effects on common receptors as a result of the Proposed Development, as summarised in **Table 18A-3**. The table demonstrates that there is the potential for common receptors to experience more than one significant effect or effect close to the threshold of significance.

18.5 Preliminary Significance Conclusion

18.5.1 The preliminary assessment of combined effects has considered whether any of the individual environmental topic effects resulting from the Proposed Development could combine to create effects that are significant, on common receptors between technical topics. The preliminary assessment focused on those receptors where significant effects have been predicted in respect of at least two or more topics and/or where the technical assessments have shown that potential individual effects are nearing the thresholds of established national criteria.

18.5.2 Overall, as demonstrated in **Table 18A-3**, potential combined effects (inter-related cumulative effects) have been identified for the following receptors:

- Wales Coast Path;
- National Cycle Network Route Network 4;
- Redwick Circular Route; and
- The following PRowS (372/56/1, 372/54/3, 372/58/3,5,1,7, 392/15A/1, 372/59/1, 372/59A/1).

18.5.3 These effects will be assessed in **Chapter 18: Cumulative Effects and Interactions**.

18.6 References

Ref 18A-1 The Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2017). Available at: http://www.legislation.gov.uk/ukxi/2017/572/pdfs/ukxi_20170572_en.pdf [Accessed December 2025].