

Chapter 6: Effect Interactions

INTRODUCTION

- 6.1** This chapter of the Environmental Statement (ES) assesses the likelihood for 'effect interactions'. Effect interactions occur because of interactions between multiple individual effects associated with just one project on a receptor, i.e., the combination of individual effects on a single receptor.
- 6.2** Note that effects arising from the Proposed Development in combination with other developments or 'Cumulative Schemes' have been discussed separately throughout this ES (in **ES Volume 1, Chapters 3 to 5** and **ES Volume 2**), as appropriate, and have not been re-iterated within this ES chapter to avoid repetition.
- 6.3** There is no established EIA methodology for assessing the nature and scale of effect interactions on a receptor. However, the European Commission (EC) has produced guidelines¹ to assist EIA practitioners in developing an approach which is appropriate to a project. These guidelines have been used to develop an approach which uses the defined residual effects of the Proposed Development (as presented throughout this ES in **ES Volume 1, Chapters 3 to 5** and **ES Volume 2**) to determine the potential for effect interactions. These residual effects are reliant on mitigation measures (as identified throughout this ES and presented in **ES Volume 1, Chapter 7: Environmental Management, Mitigation and Monitoring**); the mitigation measures have been assumed to be secured / implemented through the discharge of relevant planning conditions and / or appropriate legal agreement.
- 6.4** The approach to defining effect interactions involves tabulating the residual effects of the Proposed Development against receptors or, where more appropriate, receptor groups to identify the potential for effect interactions. Residual effects that are beneficial, neutral or adverse in nature and that are minor, moderate or major in scale have been considered.
- 6.5** The residual effects highlighted in **green** within the tables presented in this chapter reflect (minor, moderate or major) beneficial effects, those in **orange** reflect (minor, moderate or major) adverse effects and those in **blue** reflect (minor, moderate or major) neutral effects².
- 6.6** Based on the definitions of what negligible effects comprise for each of the technical assessments (refer to **ES Volume 1, Chapters: 3 to 5**), these, as well as where 'No Effect' has been determined, do not warrant further consideration in relation to effect interactions and therefore have not been pulled through into the assessment within this ES chapter.
- 6.7** A qualitative approach has been undertaken to the assessment of effect interactions and, professional judgement has been used to determine whether the combination of multiple individual effects results in an effect interaction on the receptor or receptor group in question.
- 6.8** The scale of an effect interaction has not been assigned as part of this assessment; however, whether the effect interaction is considered to be a likely significant effect has been identified. For example, when one or more significant residual effects (i.e., effects that are typically moderate or major in scale) from different topics coincide on a receptor or receptor group, the effect interaction is considered to be '**Significant**'. If none of the individual topic residual effects are significant, consideration has been given as to whether the combination of many not significant effects could result in a combined significant effect interaction; this is based on professional opinion.
- 6.9** Effect interactions arising from the enabling and construction works, the completed and operational Proposed Development, and following the decommissioning of the Proposed Development are discussed.
- 6.10** This ES chapter has been divided into three parts:
- **Table 6.1** addresses the potential for effect interactions to relevant receptors / receptor groups arising from the enabling and construction works;
 - **Table 6.2** addresses the potential for effect interactions to relevant receptors / receptor groups arising from the completed and operational Proposed Development; and
 - **Table 6.3** addresses the potential for effect interactions to relevant receptors / receptor groups arising from the decommissioning works.

¹ European Community (1999); Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.

ENABLING AND CONSTRUCTION

6.11 Table 6.1 presents the effect interactions assessment for the enabling and construction works.

Table 6.1 Potential for Effects Interactions – Enabling and Construction

Sensitive Receptor	Technical Topic Area and Residual Effects	Scale of Residual Effect	Significance	Potential for Effect Interactions
Best and most versatile (BMV) agricultural land	Land Take and Soils (Agriculture) Loss of 21.4ha of land in Grades 2 and Subgrade 3a	Moderate Adverse	Significant	NO (No effects to interact with)
Soil resources	Land Take and Soils (Agriculture) The soil is unable to fulfil all of its primary functions due to loss of agricultural land	Moderate Adverse	Significant	NO (No effects to interact with)
The landscape character of the site and the area of the Wooded Estatelands extending west across Warren Farm and 450m northeast within the Nuneham Courtenay Registered Park and Garden	Landscape and Visual Impact Assessment Effect of construction related activities on landscape character and setting	Moderate to Major Adverse	Significant	NO (No effects to interact with)
The landscape character and setting of the western edge of the Nuneham Courtenay Registered Park and Garden				NO (No effects to interact with)
Views (Visual Amenity)	Landscape and Visual Impact Assessment Effect of construction related works on views, specifically: Views 1, 2, 12 and 13	Minor Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Effect of construction related works on views, specifically: Views 3, 5 and 17	Moderate Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Effect of construction related works on views, specifically: Views 4, 6 – 11, 14 – 16	Moderate to Major Adverse	Significant	NO (No effects to interact with)
Nuneham Courtenay Registered Park and Garden	Cultural Heritage (Built Heritage) Alteration to setting through construction works, including noise, dust, vehicle and construction plant movements and visual changes.	Moderate Adverse	Significant	NO (No effects to interact with)
Nuneham Courtenay Conservation Area				NO (No effects to interact with)
Thame Lane Bridge		Minor Adverse	Not Significant	NO (No effects to interact with)
Early Prehistoric Flintwork	Cultural Heritage (Archaeology) Effect of ground establishment works and construction activities on known and potential below ground	Moderate Adverse	Significant	NO (No effects to interact with)
Neolithic artefact finds and features				NO (No effects to interact with)

² As noted within **ES Volume 1, Chapter 1: Introduction and EIA Methodology**, neutral effects are relevant for the Landscape and Visual Impact Assessment (**ES Volume 2**).

Sensitive Receptor	Technical Topic Area and Residual Effects	Scale of Residual Effect	Significance	Potential for Effect Interactions
Later Prehistoric (Bronze Age) activity within the site	archaeological remains and deposits	Minor Adverse ³	Significant	NO (No effects to interact with)
Identified Later Prehistoric (Iron Age) activity within the site				NO (No effects to interact with)
Identified Roman activity within the site				NO (No effects to interact with)

6.12 Table 6.1 has not identified any potential effect interactions during the enabling and construction of the Proposed Development.

COMPLETED DEVELOPMENT

6.13 Table 6.2 presents the effect interactions associated with the completed and operational Proposed Development.

Table 6.2 Potential for Effects Interactions – Completed and Operational Development

Sensitive Receptor	Technical Topic Area and Residual Effects	Scale of Residual Effect	Significant Effects	Potential for Effect Interactions
Global atmospheric mass of the relevant GHGs and consequent warming potential	Climate Change Avoided GHG emissions due to the nature of the project	Negligible – Significant Beneficial	Significant	NO (No effects to interact with)
Topography and Watercourses	Landscape and Visual Impact Assessment Year 1 - Changes to the topography of the site	Moderate Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Year 10 - Changes to the topography of the site	Minor Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Year 20 - Changes to the topography of the site	Negligible to Minor Adverse	Not Significant	NO (No effects to interact with)
Trees, Hedgerows and other Landscape Features	Landscape and Visual Impact Assessment Changes to the landscape and net gain in tree cover	Major Beneficial	Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Year 20 - Biodiversity Net Gain	Moderate Beneficial	Not Significant	NO (No effects to interact with)
Landscape	Landscape and Visual Impact Assessment Year 1, Year 10 and Year 20 - Changes to the landscape character of area of field within the site	Moderate to Major Adverse	Significant	NO (No effects to interact with)

³ As set out in **ES Volume 1, Chapter 3: Cultural Heritage**, professional judgement has been used to determine whether an effect is significant or not. Where mitigation such as archaeological evaluation works may reduce the scale of an effect, the effect significance may remain the same. As such, a Minor Adverse effect may still be considered as 'Significant'.

Sensitive Receptor	Technical Topic Area and Residual Effects	Scale of Residual Effect	Significant Effects	Potential for Effect Interactions
	Landscape and Visual Impact Assessment Year 1 - Changes to the landscape character and setting of the site within the Nuneham Courtenay Registered Park and Garden	Moderate Adverse	Not Significant	NO (No effects to interact with)
				NO (No effects to interact with)
				NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to the character of the Lowland Plains LCT	Minor Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Year 10 - Changes to the landscape character and setting of the site within the Nuneham Courtenay Registered Park and Garden	Minor Beneficial	Not Significant	NO (No effects to interact with)
				NO (No effects to interact with)
Views (Visual Amenity)	Landscape and Visual Impact Assessment Year 20 - Changes to the landscape character and setting of the site within the Nuneham Courtenay Registered Park and Garden	Moderate Beneficial	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 3 (Year 1) View 4 (Year 1) View 7 (Year 1) View 8 (Year 1) View 14 (Year 1)	Moderate to Major Adverse	Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 16 (Year 1)	Minor to Major Adverse	Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 3 (Year 10) View 5 (Year 1) View 9 (Year 1, 10 and 20) View 10 (Year 1 and 10) View 11 (Year 1 and 10) View 13 (Year 1 and 10) View 15 (Year 1)	Moderate Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 10 (Year 20) View 11 (Year 20) View 17 (Year 1)	Minor to Moderate Adverse	Not Significant	NO (No effects to interact with)
				NO (No effects to interact with)

Sensitive Receptor	Technical Topic Area and Residual Effects	Scale of Residual Effect	Significant Effects	Potential for Effect Interactions
	Landscape and Visual Impact Assessment Changes to views, specifically: View 16 (Year 10) View 17 (Year 10 and 20)	Negligible to Moderate Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 4 (Year 10) View 5 (Year 10) View 6 (Year 1) View 7 (Year 10 and 20) View 8 (Year 10 and 20) View 12 (Year 1, 10 and 20) View 14 (Year 10) View 15 (Year 10)	Minor Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 16 (Year 20)	Minor Beneficial to Moderate Adverse	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 15 (Year 20)	Neutral to Minor Beneficial	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 1 (Year 20) View 2 (Year 20) View 3 (Year 20) View 4 (Year 20) View 5 (Year 20) Year 14 (Year 20)	Minor Beneficial	Not Significant	NO (No effects to interact with)
	Landscape and Visual Impact Assessment Changes to views, specifically: View 6 (Year 10 and 20)	Moderate Beneficial	Not Significant	NO (No effects to interact with)
Nuneham Courtenay Registered Park and Garden	Landscape and Visual Impact Assessment Alteration to the landscape setting and character of heritage assets	Minor Adverse ⁴ to Moderate Beneficial	Significant	NO (No effects to interact with)
	Cultural Heritage (Built Heritage) Alteration to setting, including changes to land use, visual changes and introduction of additional activity.	Minor Adverse	Not Significant	NO (No effects to interact with)
Nuneham Courtenay Conservation Area	Landscape and Visual Impact Assessment Alteration to the landscape setting of heritage assets	Neutral	Not Significant	NO (No effects to interact with)

⁴ Note, the Minor Adverse effect relates to the proposed connection tower within the Registered Park and Garden, however (as noted in para. 8.113 of **ES Volume 2**) a significant beneficial effect was established for the receptor as a result of landscaping changes upon the setting of the parkland and in allowing permissive public access.

Sensitive Receptor	Technical Topic Area and Residual Effects	Scale of Residual Effect	Significant Effects	Potential for Effect Interactions
	Cultural Heritage (Built Heritage) Alteration to setting, including changes to land use, visual changes and introduction of additional activity.	Minor Adverse	Not Significant	NO (No effects to interact with)
Archaeological Field Results	Cultural Heritage (Archaeology) The preservation by record of archaeological remains provides archaeological knowledge of the site which may contribute towards relevant research objectives.	Negligible to Minor Beneficial	Not Significant	NO (No effects to interact with)

6.14 Table 6.2 has not identified any potential effect interactions during the operational phase of the Proposed Development.

DECOMMISSIONING

6.15 Table 6.3 presents the effect interactions assessment associated with the decommissioning of the Proposed Development.

Table 6.3 Potential for Effects Interactions – Decommissioning

Sensitive Receptor	Technical Topic Area and Residual Effects	Scale of Residual Effect	Significant Effects	Potential for Effect Interactions
Nuneham Courtenay Conservation Area	Cultural Heritage (Built Heritage) Alteration to setting through construction works, including noise, dust, vehicle and construction plant movements and visual changes.	Moderate Adverse	Significant	NO (No effects to interact with)
		Minor Adverse	Not Significant	NO (No effects to interact with)
Nuneham Courtenay Registered Park and Garden	Landscape and Visual Impact Assessment Effect upon character and setting	Moderate Beneficial	Not Significant	NO (No effects to interact with)
	Cultural Heritage (Built Heritage) Alteration to setting through decommissioning works, including noise, dust, vehicle and construction plant movements and visual changes.	Moderate Adverse ⁵	Significant	NO (No effects to interact with)
Users of the Oxford Green Belt Way	Landscape and Visual Impact Assessment Effect upon visual amenity	Moderate Beneficial	Not Significant	NO (No effects to interact with)

6.16 Table 6.3 has not identified any potential effect interactions during the decommissioning phase of the Proposed Development.

⁵ Note, long-term effects associated with the permanent features (landscaping and the connection tower) within the Registered Park and Garden are considered to have an overall Negligible effect.

SUMMARY AND CONCLUSION

- 6.17** This ES chapter has considered the potential for effect interactions between individual residual effects presented throughout the ES (in **ES Volume 1, Chapters 3 to 5** and **ES Volume 2**).
- 6.18** During the enabling and construction works, once the Proposed Development is completed and operational, and following decommissioning of the Proposed Development, it has been established that there is no potential for effect interactions.