17 Effect Interactions

17.1 Introduction

17.1.1 This chapter assesses the interaction of individual effects of the Proposed Development upon identified receptors / resources from multiple technical topics in the EIA (known as 'intra-project' effects). This chapter forms part of the cumulative assessment provided within this ES.

17.1.2 Details on the assessment approach for inter-project effects of the Proposed Development with other cumulative schemes are provided in Chapter 3: EIA Methodology. The inter-project cumulative assessments are provided in each technical chapters of this ES (Chapters 7–16 and Volume II).

17.2 Methodology

17.2.1 There is no consistent guidance or standardised approach to the assessment of effect interactions. However, it is recognised that the Proposed Development has the potential to give rise to a variety of impacts upon a number of different receptors, some of which have the potential to combine to become significant effects.

17.2.2 Table 17.1 provides a summary matrix showing where effect interactions would occur between environmental topics that have been scoped into the EIA for the Proposed Development. For the purposes of this assessment, where no effect interactions between environmental topics occur these topics are scoped out of further assessment.

Table 17.1: Summary Matrix of Effect Interactions

Topic	SE	CH	T&A	N&V	AQ	CC	E	AL	GC	W	LVIA
SE		N	Y	Y	Y	N	N	N	N	N	Y
CH	N		N	N	N	N	N	N	N	N	N
T&A	Y	N		Y	Y	N	N	N	N	N	Y
N&V	Y	N	Y		Y	N	N	N	N	N	Y
AQ	Y	N	Y	Y		N	Y	N	N	N	Y
CC	N	N	N	N	N		N	N	N	N	N
E	N	N	N	N	Y	N		N	N	Y	N
AL	N	N	N	N	N	N	N		N	N	N
GC	N	N	N	N	N	N	N	N		N	N
W	N	N	N	N	N	N	Y	N	N		N
LVIA	Y	N	Y	Y	Y	N	N	N	N	N	

Key:

N: No potential for effect interactions; Y: Potential for effect interactions; SE: Socio-Economics; CH: Cultural Heritage; T&A: Transport and Access; N&V: Noise and Vibration; AQ: Air Quality; CC: Climate Change and Greenhouse Gases; E: Ecology; AL: Agricultural Land and Soils; GC: Ground Conditions and Contamination; W: Water Resources and Flood Risk; and LVIA: Landscape and Visual Impacts.

17.2.3 The assessment of transport, noise and vibration, air quality, and landscape and visual effects all concern ground level human receptors, namely the occupants of properties in proximity to the Site, the users of the road network, drivers, pedestrians and cyclists on the surrounding road network, users of the surrounding Public Rights of Way (PRoW), and future occupiers of the Proposed Development. Human receptors are principally considered in relation to their health and wellbeing.

17.2.4 Human receptors have the potential to experience an interaction between transport, air quality, noise and vibration, landscape and visual effects, and indirectly ground conditions and flood risk. if there is a spatial and temporal overlap of effects acting on these receptors. There is also an indirect effect of socio-economics which is conducted at a greater spatial scale.

17.2.5 Agricultural land receptors (i.e. soils) do not have direct links with other receptors and are indirectly considered in Chapter 15: Ground Conditions and Contamination and Chapter 16: Water Resources and Flood Risk as relevant. Human agricultural receptors (i.e. the two tenant farmers) are assessed in Chapter 7: Socio-Economics.

17.2.6 The potential cultural heritage effects only impact on buried archaeological assets and built heritage assets, imposing no effects on people. Therefore, cultural heritage effects are scoped out of further consideration in this chapter as there is no potential for effect interactions with other topics. Visual effects on the setting of heritage assets have inherently been considered in the assessment provided in Chapter 8: Cultural Heritage.

17.2.7 Water resources and air quality are fundamentally linked to biodiversity receptors. However, these aspects are inherently considered in Chapter 13: Ecology and assessed in the respective ES chapters and associated appendices as applicable, and are not assessed herein as an effect interaction.

17.2.8 Considering the above, the following topics are taken forward for assessment:

- Socio-Economics;
- Transport and Access;
- Noise and Vibration;
- Air Quality;
- Water Resources and Flood Risk;
- Ground Conditions; and
- Landscape and Visual.

17.2.9 Table 17.2 summarises the proposed receptor-based assessment process to be used for both construction and operation of the Proposed Development for those technical topics identified within paragraph 17.2.8, which should an effect be identified may be able to interact and cause an effect interaction.

Table 17.2: Effect Interactions Assessment Process

Step	Description
Step 1: Identify and categorise receptors	Identify all topic sensitive receptors and their geographical locations based on the study areas and study areas of the respective technical assessments. These will then be categorised by type.
Step 2: Identify impacts	Identify all topic impacts associated with sensitive receptor(s)/ receptor types.
Step 3: Screen receptors and associated impacts	Undertake a screening exercise upon the identified receptors and impacts. Screened items out from further assessment if they are: ▪ Receptors where no topic impacts overlap; ▪ Receptors with no temporal overlap with topic impacts; or ▪ Receptors where topic impacts are identified as 'negligible'.
Step 4: Assess effect interactions	Qualitative assessment based on professional judgement of the effect interactions.

17.2.10 The intra-project effects assessment uses professional judgement and takes a qualitative assessment approach. Assessing the significance of effects interaction requires subjective judgement about how well a receptor is able to accommodate the multiple changes that will occur as a result of the Proposed Development.

17.2.11 The study area, or Zone of Influence (ZoI), for the in-combination effects assessment was defined by the study areas of the scoped-in environmental topic assessments, which are discussed in the relevant topic chapters.

17.2.12 Steps 1 and 2 were undertaken within each technical assessment as part of the assessment of effects process. Steps 3 and 4 were undertaken by the EIA co-ordinators, Quod, for both the construction and completed development phases.

17.2.13 During the screening exercise, a spatial overlap was identified when the same receptor was identified in more than one technical chapter. These effects were then checked for a temporal overlap. If both a spatial and temporal overlap were identified, and the associated topic effects were above negligible, then the intra-project effects on that receptor / receptor group were taken forward for assessment (Step 4).

17.3 Baseline

17.3.1 The baseline for the effect interactions assessment for this EIA is as described in each technical chapter affecting:

- Current Site users, drivers, pedestrians and cyclists on the surrounding road network, PRoWs, recreational users of the Site and surrounding area and occupants of existing properties on the surrounding road network during the construction phase; and
- Future Site occupiers, drivers, pedestrians and cyclists on the surrounding road network, PRoWs, recreational users of the site and surrounding area and occupants of properties on the surrounding road network and other surrounding areas to the Site during the completed development phase.

17.4 Assessment of Effects

Construction Phase Effects

17.4.1 No residual effects with a minor significance or greater were identified in the socio-economic; air quality; ground condition; water resources and flood risk; and landscape and visual assessments during the construction phase. As such, these topics have not been considered further.

17.4.2 Effects of a minor significance or greater were identified for drivers, pedestrians and cyclists on the surrounding road network, occupants of an existing property in proximity to the Site, and commercial users of Begbroke Science Park.

17.4.3 Table 17.3 provides an assessment of these potential effect interactions.

Table 17.3: Potential Effect Interactions – Construction

Receptor	Chapter	Residual Effect (as reported in topic chapter)	Assessment of Effect Interaction
Current Site users; drivers, pedestrians and cyclists on the surrounding road network and PRoWs; recreational users of the surrounding area; and occupants of existing properties in the vicinity of the Site and on the surrounding road network.	Chapter 9: Transport and Access	Negligible to Minor Adverse	Based on the residual construction effects outlined in column 3 of this table, it is considered that there is potential for temporary effect interactions on the residents of 31 Sandy Lane and commercial users of Begbroke Science Park. Further details are provided in the paragraphs below.
	Chapter 10: Noise and Vibration	Significant effects on 31 Sandy Lane and commercial users of Begbroke Science Park.	

17.4.4 Residents of 31 Sandy Lane and employees and visitors to Begbroke Science Park (and the associated local road connections) will experience localised noise and transport effects during construction works. In practice, the exact location and duration of construction activities will vary as the Proposed Development is built out meaning the identified receptors will experience fluctuations in the magnitude of the aforementioned effects over the course of the eight-year construction programme and may only experience significant effects during short extents of this period when specific works are localised. Although effects have been identified as potentially acting on two receptor groups for a specific period of time, the nature of these effects are not considered to be synergistic.

17.4.5 The lack of synergistic interaction along with the varying source location and intensity of potential effects during construction works is unlikely to result in effects greater than individual residual effects identified for transport and noise and vibration in isolation. Furthermore, the construction activities will be typical of an urban development project of this scale and nature meaning the standard mitigation measures, such as adherence to

controls set out in the Framework CEMP and Framework CTMP will be adequate to effectively mitigate this effect interaction. Therefore, no significant effect interactions are predicted.

Completed Development Effects

17.4.6 No residual effects with a minor significance or greater were identified in the noise or air quality assessments. As such no effect interactions were identified for these topics and they have not been considered further.

17.4.7 Effects of minor significance or greater were identified for socio-economics, transport and access, ground conditions and contamination, and landscape and visual assessments. Therefore, there is potential to experience an effect interaction between these topics where applicable to the same receptor(s). Table 17.4 provides an assessment of these potential effect interactions.

Table 17.4: Potential Effect Interactions – Completed Development

Receptor	Chapter	Residual Effect (as reported in topic chapter)	Assessment of Effect Interaction
Future Site occupiers; drivers, pedestrians and cyclists on the surrounding road network and PRoWs; recreational users of the Proposed Development and surrounding area; and occupants of properties on and in vicinity of the Site, and on the surrounding road network.	Chapter 7: Socio-economics	Major Beneficial effects on: housing delivery; primary and secondary education demand; employment and labour market; economy and demand for open space, sport and play provision.	Based on the residual completed Proposed Development effects outlined within column 3 of this table, it is considered that there is potential for effect interactions on identified receptors. This is discussed in further detail in the paragraphs below.
	Chapter 9: Transport and Access	Negligible to moderate beneficial effects on users of the surrounding road network. Minor adverse effects on driver delay.	
	Chapter 15: Ground Conditions and Contamination	Moderate beneficial effects on future on-Site users due to a reduction in exposure to ground gas associate with historical and current land use.	

Receptor	Chapter	Residual Effect (as reported in topic chapter)	Assessment of Effect Interaction
	Volume II: Landscape and Visual	Minor neutral to major adverse impacts on the views from specified viewpoints.	

17.4.8 Future users of the Site and surrounding area will experience beneficial effects due to socio-economic improvements, specifically improvements in delivery of housing, educational and sports/amenity facilities, open space, and employment opportunities. There would also be localised beneficial effects to existing residential receptors in the vicinity of the historical landfill side due to a reduction in exposure to ground gas associated with the remediation of this land for use as public open space. Future Site users may also experience beneficial effects on transport and access due to improvements in the surrounding transport network and internal connections.

17.4.9 Users of the surrounding road network and recreational users of the surrounding area may potentially experience some negative effect interactions due to adverse impacts on views from specified viewpoints and driver delay.