14. INTERACTION OF EFFECTS

14.1 Introduction

The preceding sections of this Environmental Impact Assessment Report (EIAR) identify the potential environmental effects that may occur in terms of Population and Human Health, Biodiversity, Land Soils and Geology, Hydrology and Hydrogeology, Air, Climate, Noise & Vibration, Landscape & Visual, Cultural Heritage and Material Assets (including Traffic), as a result of the Proposed Development as described in Chapter 3 of this EIAR. All of the potential effects of the Proposed Development and the measures proposed to mitigate them have been outlined in the preceding sections of this report. However, for any development with the potential for significant environmental effects there is also the potential for interaction amongst these effects. The result of interactive effects may exacerbate the magnitude of the effects or improve them, or have a neutral effect.

A matrix is presented in Table 14-1 to identify interactions between the various aspects of the environment already discussed in this report. The matrix highlights the occurrence of potential positive or negative effects during both the construction (C) and operational (O) phases. It is considered that the potential effects during the decommissioning phase will be similar to the construction phase effects but of a lesser magnitude. The matrix is symmetric, with each environmental component addressed in the previous sections of this report being placed on both axes of a matrix, and therefore, each potential interaction is identified twice. In Section 14.2 below, the potential interactions between each environmental component have been discussed in order of the relevant chapters of the EIAR. Once a potential interaction between two environmental components has been discussed, i.e., Population & Human Health and Hydrology & Hydrogeology, the interaction will not be discussed again in the following relevant section, i.e., Hydrology & Hydrogeology and Population & Human Health in the Hydrology & Hydrogeology section.

Table 14-1 Interaction Matrix

	Phase	Population and Human Health	Biodiversity	Land, Soils & Geology	Hydrology & Hydrogeology	Air	climate	Noise & Vibration	Landscape and Visual	Cultural Heritage	Material Assets
Population and Human Health	C										
	O										
Biodiversity	C										
	O										
Land, Soils & Geology	C										
	O										
Hydrology & Hydrogeology	C										
	O										
Air	C										
	O										
Climate	C										
	O										
Noise & Vibration	C										
	O										
Landscape & Visual	C										
	O										
Cultural Heritage	C										
	O										
Material Assets	C										
	O										

Legend:

Potential Positive Effect:

Potential Neutral Effect:

Potential Negative Effect:

No Interacting Effect:

The potential for interaction of effects has been assessed, throughout this EIAR. While the work on all parts of the EIAR was not carried out by MKO, the entire project and all the work of all sub-consultants was managed and coordinated by the company. This EIAR was edited and collated by MKO as an integrated report of findings from the impact assessment process, by all relevant experts, and effects that potentially interact have been assessed in detail in the individual chapters of the EIAR above and summarised in Section 14.2 below.

Where any potential negative effects have been identified during the assessment process, these effects have been avoided or reduced by design and the proposed mitigation measures, as presented throughout the EIAR and highlighted in Section 14.2 below.

14.1.1 Statement of Authority

This section of the EIAR has been prepared by Eoin O'Sullivan and reviewed by Michael Watson, both of MKO. Eoin O'Sullivan is employed as a Project Director Environment with MKO. Eoin has over fifteen years' experience in the assessment of a wide range of energy and infrastructure related projects and working in the fields of environmental and human health risk assessment, waste management, waste policy and permitting. Eoin has wide experience in the project management of large-scale infrastructural projects and brownfield developments. Eoin holds an MSc in Environmental Engineering and is a Chartered Member of the Chartered Institute of Water and Environmental Management (CWEM) and Chartered Environmentalist (CEnv) with the Society of Environment. Michael has over 20 years' experience in the environmental sector and had worked for the Geological Survey of Ireland and then a prominent private environmental & hydrogeological consultancy prior to joining MKO in 2014. Michael completed an MA in Environmental Management at NUI, Maynooth in 1999. Michael is a professional geologist (PGeo) and full member of IEMA (MIEMA) as well as a Chartered Environmentalist (CEnv).

14.2 Impact Interactions

Where any potential negative effects have been identified during the assessment process, these effects have been avoided by design or reduced by the proposed mitigation measures.

14.2.1 Population and Human Health

Population and Human Health, Air, Noise and Vibration

As identified in Chapter 3 of this EIAR, the construction phase has the potential to create temporary slight negative effects on human health due to the nuisance caused by construction plant and vehicle noise emissions, should the mitigation measures outlined in Chapter 8 Air and Chapter 10 Noise & Vibration not be implemented. In addition, the operational phase has the potential to a create long term moderate negative effect should the mitigation measures outlined in Chapter 8 Air and Chapter 10 Noise & Vibration not be implemented.

Population and Human Health, Land, Soils and Geology, Air

The extraction and movement of material during the construction and operational phases of the Proposed Development has the potential to create dust emissions which, consequently, have the potential to have a slight to moderate negative effect on local air quality and human health in the absence of mitigation measures. Mitigation measures to reduce dust emissions generated during the construction and operational phases of the Proposed Development are presented in Chapter 8.

Population and Human Health and Hydrology & Hydrogeology

As described in Chapter 7 of this EIAR, the construction and operational phases of the Proposed Development have the potential to give rise to some water pollution as a result of site activities, and any water pollution could have a potential significant negative effect on the health of other users of that water within the same catchment. Mitigation measures are presented in Chapter 7 to minimise the potential of any such issues occurring.

Population and Human Health, and Material Assets

Chapter 13 of this EIAR discusses how the construction and operational phases of the project will give rise to additional traffic volumes on the local road network and, therefore, is likely to create some long-term effects. The negative effects on existing traffic turning into and out of the existing site access will however be mitigated by safety improvements provided by the proposed improved junction layout.

Population & Human health and Landscape and Visual

The measure implemented as part of the site restoration, including replanting of treelines and hedgerows along the site boundary and landscape berms, will provide substantial visual screening of extraction phase activities and mitigate many of the associated visual effects for receptors in close proximity to the Proposed Development. Positive landscape and visual effects will occur following the restoration phase as the quarry void will be infilled and restored to its original land contours.

14.2.2 Biodiversity

Biodiversity and Hydrology & Hydrogeology

Site activities during the construction phase have the potential to give rise to some water pollution, and consequential indirect effects (such as disturbance and deterioration of habitat quality) on flora and fauna that use that water within the same catchment. These potential effects have been assessed in Chapter 5 and Chapter 7 of this EIAR, and the relevant measures outlined in these chapters will be in place to avoid any water pollution and subsequent effect on flora and fauna.

Biodiversity and Noise & Vibration

Site activity during the construction and operational phases has the potential to give rise to noise and some vibration that could disturb fauna. Best practice mitigation measures are included in Chapter 5 and Chapter 10 to minimise the potential negative effect of noise generated during the construction phase and operational phases on biodiversity.

Biodiversity and Air

Site activity during the construction and operational phases could give rise to dust that could be a nuisance to flora and fauna. The mitigation measures outlined in Chapter 8 of the EIAR will ensure that the potential for negative effects is reduced or eliminated.

Biodiversity and Landscape

It is proposed to retain the existing hedgerow and treeline surrounding the Proposed Development areas in order to provide cover and commuting corridors for local flora and fauna.

14.2.3 Land, Soils and Geology

Land, Soils & Geology and Hydrology & Hydrogeology

The extraction and movement and backfilling of soils and overburden during the construction and operational phase has the potential to give rise to impact on water quality. Mitigation measures to ensure there are no significant, negative effects on water quality are presented in Chapter 7.

Land, Soils & Geology and Air

The extraction and movement and infilling of soils during the construction and operational phases has the potential to give rise to noise and dust effects. Mitigation measures are presented in Chapter 8 Air and to minimise the risk of any such issues.

14.2.4 Air

Air and Material Assets

The movement of vehicles both within and to and from the site has the potential to give rise to noise and dust nuisance effects during the construction and operational phases. This is assessed further in Chapter 8 Air of this EIAR, and mitigation measures are presented to minimise any potential effects.

14.3 Mitigation and Residual Impacts

Where any potential interactive negative effects have been identified in the above, a full suite of appropriate mitigation measures has already been included in the relevant sections (Chapters 3-13) of the EIAR. The implementation of these mitigation measures will reduce or remove the potential for these effects. Information on potential residual effects, and their significance, is also presented in each relevant chapter.